THAPAR POLYTECHNIC COLLEGE

SECOND MID SEMESTER ASSIGNMENT

Department: Electrical Engineering **Semester: 6th**

Subject: Utilization of Electrical Energy **Teacher Name: Ms. Abha**

Q1. Explain Electrical multiple unit system?
Q2. Explain train lighting system?
Q3. Explain different mechanical load in electrical drive?
Q4. Explain characteristics of mechanical load in electrical drive system?
Q5. Compare the total annual cost of a group drive with a motor costing Rs. 50,000 with that of ten individual motors, each costing Rs. 13,500 with group drive, annual consumption is 70,000 kWh and with separate drives annual consumption is 55,000 kWh. Electrical energy costs Rs. 3.00 per kWh. Depreciation, maintenance and other fixed charges amount to 12% in the case of group drive and 15% in the other case.
Discuss possible reasons for which you may decide in favour of the drive with a higher capital cost.

THAPAR POLYTECHNIC COLLEGE

THIRD MID SEMESTER ASSIGNMENT

Department: Electrical Engineering **Semester: 6th**

Subject: Utilization of Electrical Energy **Teacher Name: Ms. Abha**

Q1. What are the requirements of a good heating element?
Q2. What is dielectric heating? What are the advantages & applications of dielectric heating?
Q3. With the help of electrical circuit diagram, explain the working of refrigerator.
Q4. Define the terms:-
(a) Emissivity
(b) Convection
(c) Refrigerant
(d) Air Conditioning

Thapar Polytechnic College, Patiala

Department of Electrical engineering

Seminar Topics

SESSION: JAN-MAY 2020

Semester/Branch: 6th Electrical **Subject Name (Code): UEE (5224)**

Faculty: Er. ABHA

S.No	Name of the student	Roll no.	Seminar Topic
1.	Abhishek	2017/81	Speed control of DC motor
2.	Akash Kumar	2017/82	Need of voltage regulator
3.	Akshdeep Singh	2017/83	Laws of illumination
4.	Amritpal Singh	2017/84	Electric circuit of a refrigerator
5.	Ankush Pandey	2017/86	CFL
6.	Ashish Jindal	2017/87	Arc welding
7.	Balwinder Singh	2017/88	Air conditioner
8.	Bikram Singh	2017/89	CFL
9.	Bobby sharma	2017/90	Sodium vapour lamp
10.	Damanpreet Singh	2017/91	Electrolysis
11.	Deepak Gupta	2017/92	Ac locomotive
12.	Deepak Ram	2017/93	Block diagram of Electric locomotive
13.	Deepak Singh	2017/94	Methods of heat transfer
14.	Dishant Joshi	2017/95	Resistance welding
15.	Gagandeep Sharma	2017/96	Sodium vapour lamp
16.	Gaurav Garg	2017/97	Sodium vapour lamp
17.	Gautam	2017/98	CFL
18.	Gunjot Singh	2017/99	Fluorescent lamp
19.	Gurpreet Singh	2017/100	Comparison of phase wound and squirrel cage induction motor
20.	Harinderpal Singh	2017/101	Carbon arc lamp
21.	Harsh Thakur	2017/103	Types of electric welding
22.	Harwinder Singh	2017/104	Incandescent lamp
23.	Jagjeet Singh	2017/105	Working electric traction
24.	Japkirat Singh	2017/106	Electrical services
25.	Jivesh Bhambri	2017/107	Importance of LED
26.	Madhur jain	2017/109	Air conditioner
27.	Manpreet Singh	2017/111	Locomotive
28.	Manpreet Singh	2017/112	Speed control of 3 phase induction motor
29.	Mukul Rahela	2017/113	Electric drive and group drive
30.	Navdeep Singh	2017/114	Atomic hydrogen welding and gas shielded arc welding
31.	Parvesh Noria	2017/115	Regenerative braking
32.	Pooja Rani	2017/116	Electrolysis

33.	Prabhjot Singh	2017/117	Mercury lamp
34.	Prabhsimran Singh	2017/118	Locomotive
35.	Prince Goyal	2017/119	Arc welding
36.	Prince Thakur	2017/120	Incandescent lamp
37.	Rajnish Pushkar	2017/121	Comparison between squirrel cage and phase wound induction motor
38.	Rajwinder Singh	2017/122	Types of welding
39.	Ram Kumar	2017/123	Neon lamp
40.	Ramandeep Singh	2017/124	Refrigerator
41.	Rekha Rani	2017/125	AC and DC traction
42.	Rishab	2017/126	Water cooler
43.	Sahil	2017/127	Sodium vapour lamp
44.	Sahil Dhall	2017/128	Resistance type welding
45.	Sakshi Sharma	2017/129	Difference between squirrel cage and phase induction motor
46.	Sanskar Sagar	2017/130	Ac locomotive
47.	Simarpreet Kaur	2017/135	Carbon arc welding and metal arc welding
48.	Shiv Kumar	2017/131	Neon lamp
49.	Shivreet Singh	2017/132	Halogen lamp
50.	Shobit Kumar	2017/133	Fluorescent lamp
51.	Shubhdeep Singh	2017/134	Comparison of phase wound and squirrel cage induction motor
52.	Snehdeep Sharma	2017/136	Speed control of DC series motor
53.	Sonu Garg	2017/137	Arc welding
54.	Taranbir Singh	2017/138	Electric drive and group drive
55.	Tushar Gautam	2017/139	DC series motor
56.	Vikas Kumar	2017/140	Electrolysis
57.	Vishal Kumar Bawa	2017/141	Rheostatic braking
58.	Gautam	2018/147	Air conditioner
59.	Inderjeet Singh	2018/148	Sodium vapour lamp
60.	Komalpreet Singh	2018/149	CFL lamp
61.	Labh Singh	2018/150	Electric circuit of refrigerator
62.	Narinder Kumar	2018/152	Halogen lamp
63.	Sachin	2018/153	DC shunt motor
64.	Sandeep Singh	2018/154	Refrigerator circuit
65.	Simranjit Singh	2018/155	Difference between air conditioner and air cooler
66.	Vikas Kumar	2018/156	Resistance heating
67.	Gurwinder Singh	2017/577	Plugging braking

YOUTUBE LINKS

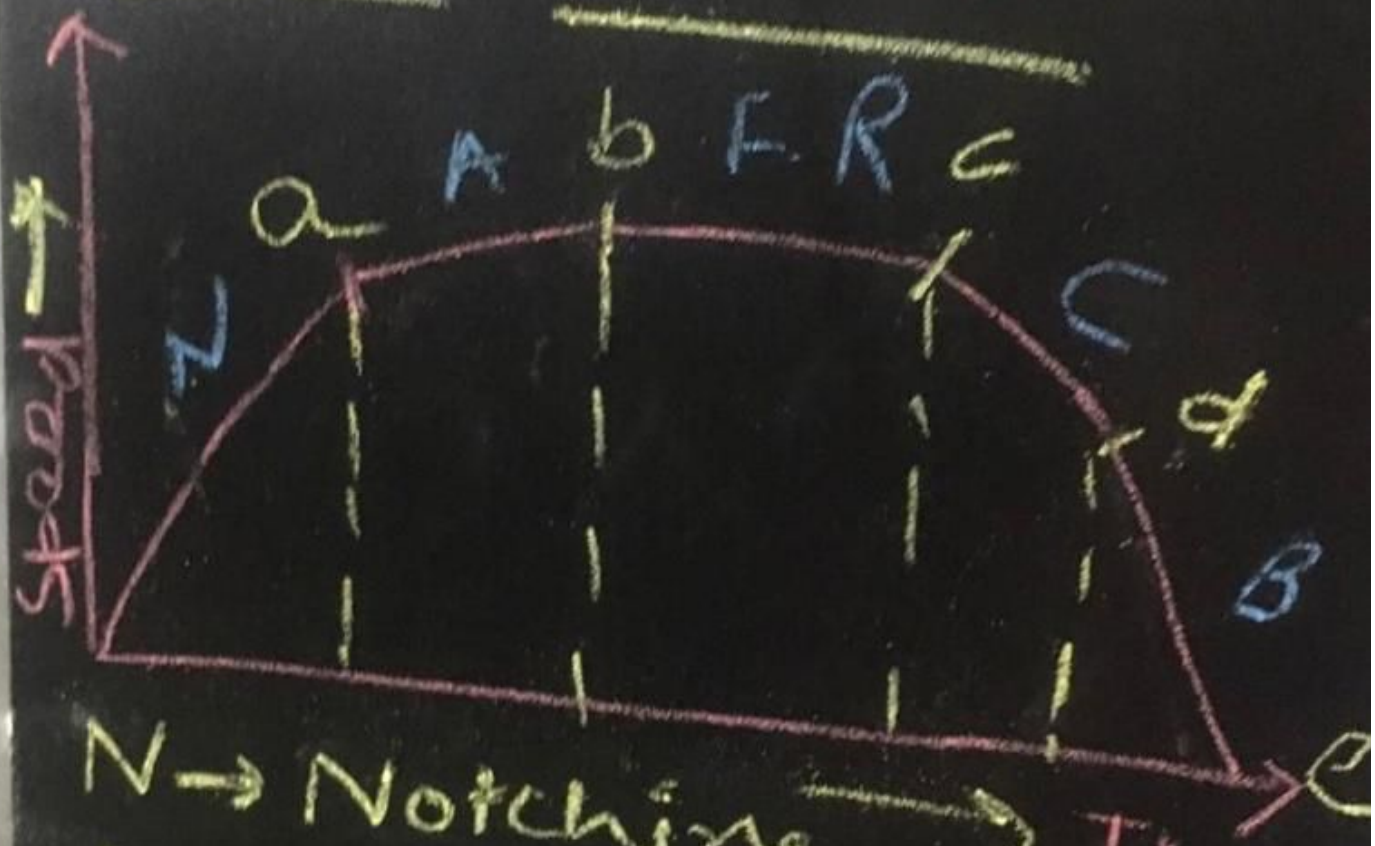
1) https://m.youtube.com/playlist?list=PLEprwsbQ0B8LwyVcXqzXkkwG68gKIrJoQ

2) https://m.youtube.com/playlist?list=PLEprwsbQ0B8LTsM8HvrDthlBgoapfSQh7

3)https://m.youtube.com/playlist?list=PLEprwsbQ0B8ITTiaONpKN3Q-bEBJKTMlQ

Electric traction

Speed - time curve :→



N → Notching

A → Accelerating

FR → Free Running

C → Coasting

B → Braking

Systems of Track Electrificat

i) D.C System

ii) A.C System

(a) 1-ϕ Standard Freq

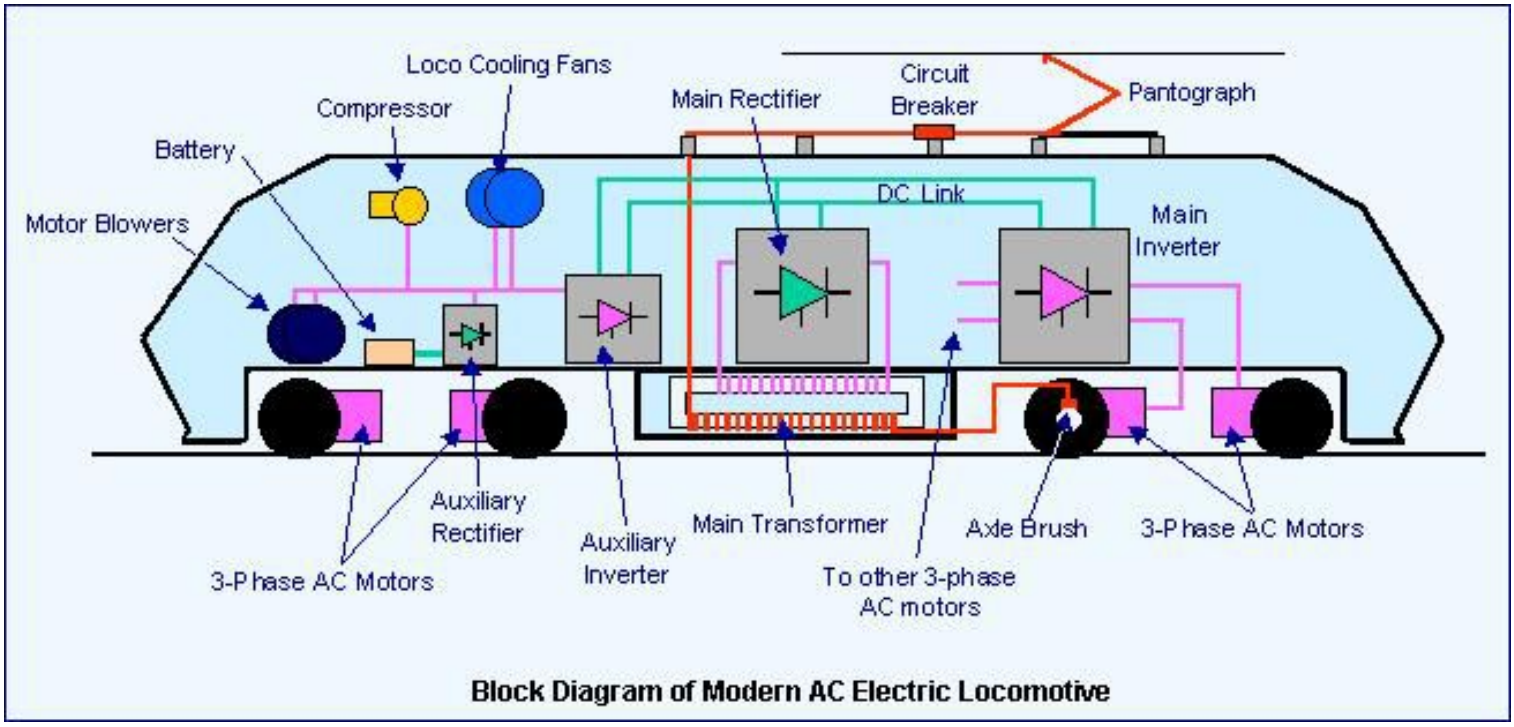
(b) 1-ϕ Low freq

(c) 1-ϕ to 3-ϕ System (Kando System)

for tramways 600 Volt d.c is given

(d) 1-ϕ ac to dc System

(c) & (d)



Block Diagram of Modern AC Electric Locomotive

$$P = V I \quad - (1)$$

$$V = I R$$

$$I = \frac{V}{R} \quad - (2)$$

Put the value of I in eqn (1)

$$P = V\left(\frac{V}{R}\right) = \frac{V^2}{R}$$

Put the value of R in eqn (1)

$$P = \frac{V^2}{R} = \frac{V^2}{\frac{\rho l}{w \times t}}$$

$$P = \frac{V^2 w t}{\rho l}$$

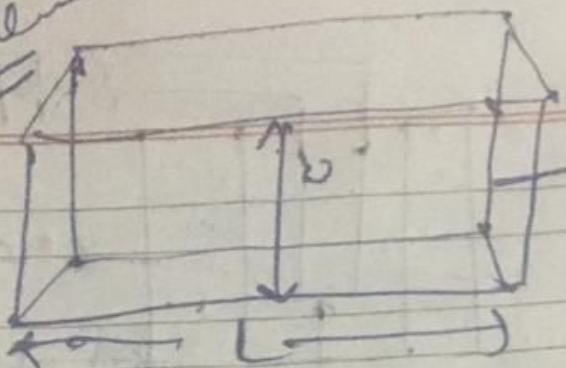
$$R = \frac{\rho l}{a}$$

$$A = w \times t$$

$$R = \frac{\rho l}{w \times t}$$

type heater

05.2.2020



$$P = \frac{V^2}{R}$$

$$R = \frac{\rho l}{a}$$

$$R \Rightarrow \frac{\rho l}{w \times t}$$

$$A = w \times t$$

$$P = \frac{V^2}{\frac{\rho \cdot l}{w \times T}} \Rightarrow \frac{V^2 w t}{\rho l}$$

$$\boxed{\frac{l}{w} = \frac{V^2 t}{P \rho}} \quad (1)$$

Surface area $S = 2 l w$

Total Heat dissipated = surface area $\times H$

If P Power (P) $\Rightarrow 2 w l H$

$P_w =$

$$\boxed{P = \frac{l w}{2H}} \quad (2)$$

Date
Page

Infrared heating :- The heat is transfered to the charge from the heating elements by radiation & convection (In simple resistance ovens)

→ In this heating low & medium temp required.

→ tungsten lamp & reflectors are used.

↳ operating temp 230°C

plated with Rhodium

The purpose of using low temp :→
production of emission of greate proportion of Infrared radiation & longer life.

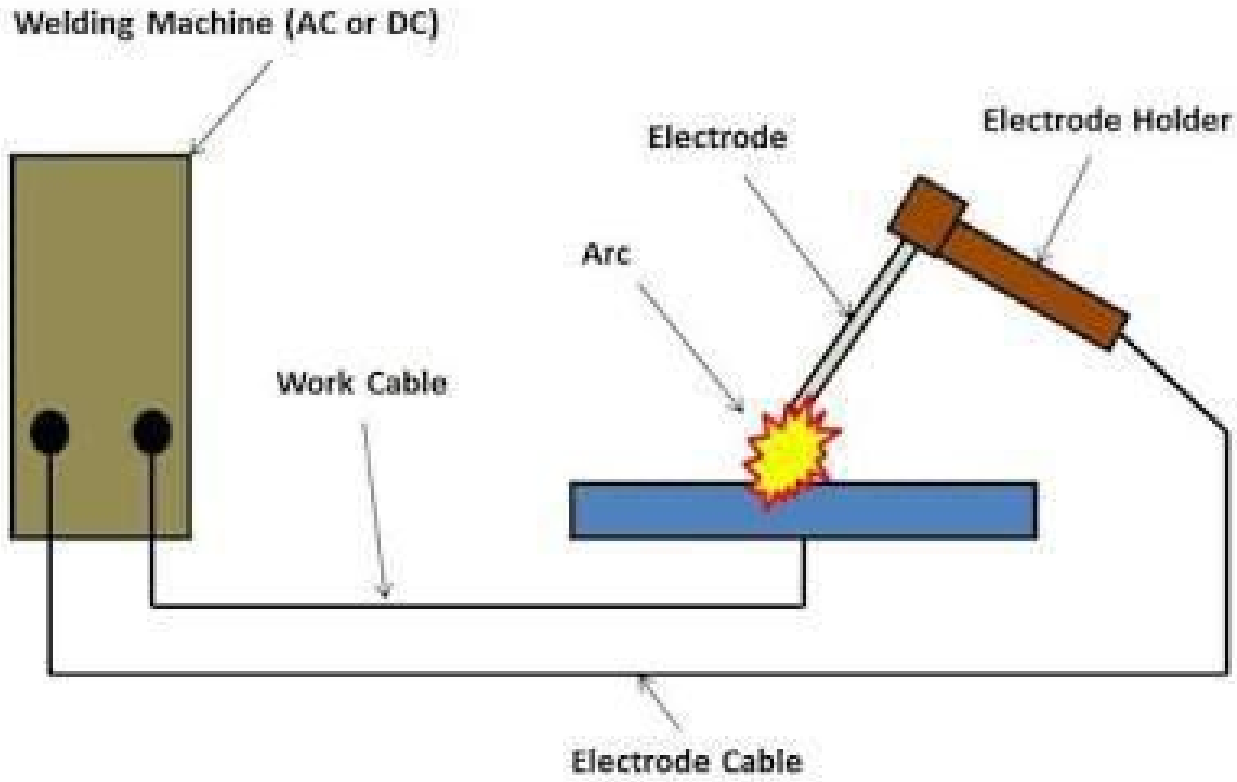
** Rating of lamps → 250W to 1100W
** operating voltage → 115 volt

lamps & reflectors groups together from the walls & also on the top of heating chamber.

maintain 25-30 cm distance b/w the lamp & object (to be heated)

Adv :- Rapid heating safety flexibility compactness of heating units.

Appl :→ Paint drying
drying of wooden furniture.
Preheating of plastic.



Basic Arc Welding Circuit Diagram

Vapour compression system :-

Compressor → Condenser → Expansion valve → Evaporator

Compressor :- It will increase the pressure & high temp. superheated vapour is injected into condenser.

Condenser :- It will gives their latent heat to the water & air which used for cooling purpose in the Condenser

Vapour → condensed → Saturated liquid

Expansion valve :- Reduction in pressure & temperature takes place

Evaporater :- Liquid + vapour

Liquid → vapour & takes all the heat from the space of evaporater or cools & lower the temp. of evaporater

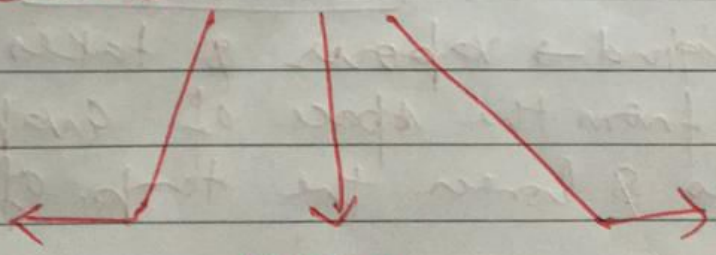
fan :- supply warm air and on the other side of evaporater fan provides cool air.

Refrigeration :- The process of reducing & maintaining the temperature of a body below the general temp of its surroundings.

Refrigerant :- It is the heat carrying substance which is circulated in a refrigeration system.

Refrigerator :- It is a machine by which the temp. of the substances is lowered by storing them in the machine

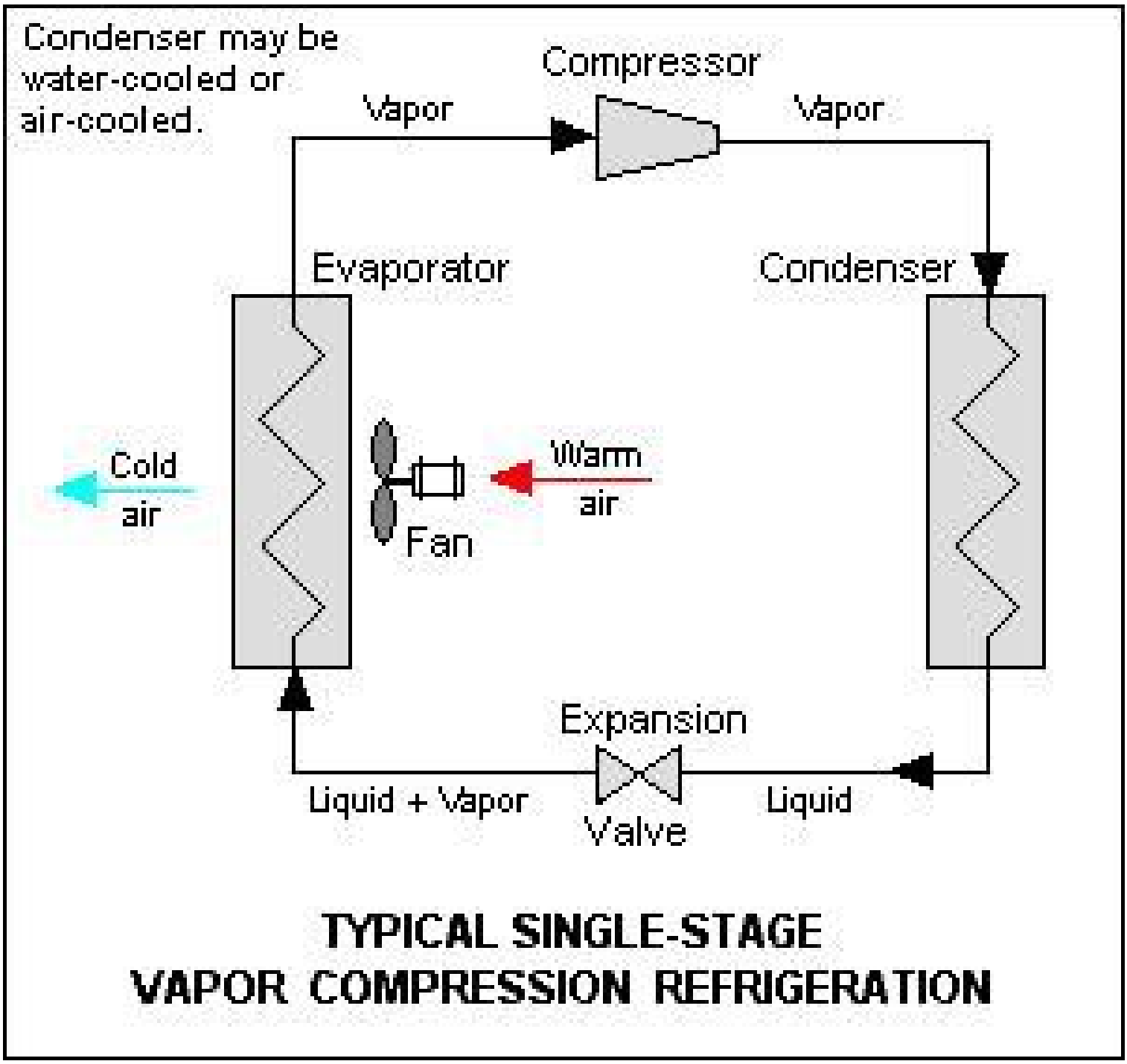
Refrigeration system :- lowering the temperature of an enclosed space by removing Heat from that space & transferring it elsewhere



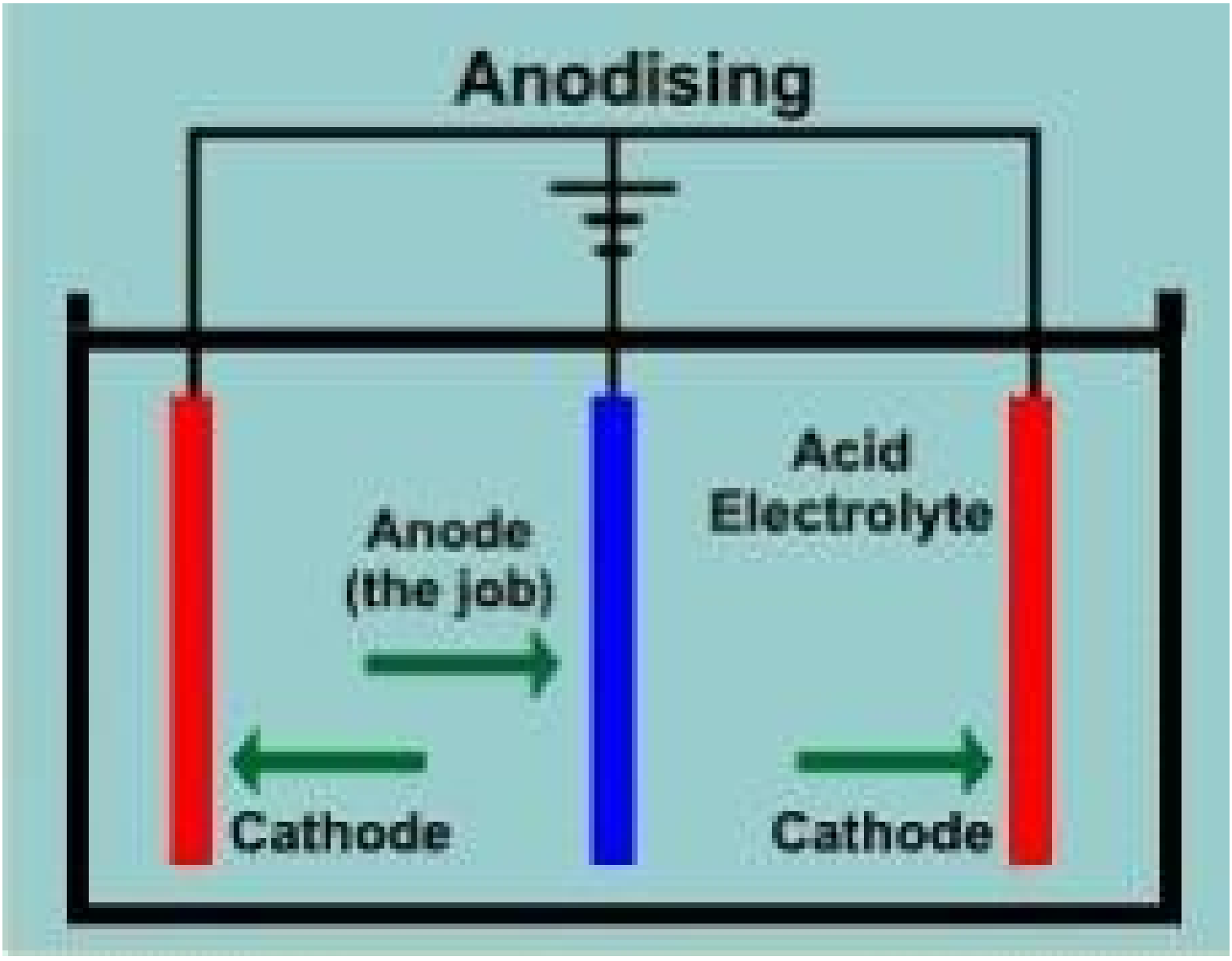
Vapour compression Refrigeration system

Vapour absorption Refrigeration system

Thermo electric refrigerat system



TYPICAL SINGLE-STAGE VAPOR COMPRESSION REFRIGERATION


Anodising
Acid
Electrolyte
Anode
(the job)
Cathode
Cathode

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Important Questions

SESSION: JAN-MAY 2020

Semester/Branch: 6th Electrical **Subject Name (Code): UEE (5224)**

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1. Laws of illumination
2. Construction & working of arc lamp
3. Construction and working filament lamp
4. Construction & working sodium vapour lamp
5. Working of Fluorescent tube
6. Resistance heating
7. Arc heating
8. Core type furnace & core-less type induction furnace
9. Infrared heating
10. Dielectric heating
11. Resistance welding
12. Arc welding
13. Difference b/w AC & DC welding
14. Faraday's laws of electrolysis
15. Deposition of metal
16. Galvanising & Anodising
17. Applications of Electrolysis
18. Vapour Compression Cycle
19. Electric circuit of a refrigerator
20. Electric circuit of air conditioning
21. Advantages & Applications of Electric Drives
22. Individual & Group drive
23. Types of braking
24. Block diagram of Electric locomotive
25. Speed time curve for main railway line
26. Train lightening system
27. EMU
28. Comparison b/w AC & DC traction system