Hindbookcenter

GET IT ON Google Play

Hind Book Center & Photostat

Unacademy

Mechanical Engineering

Toppers Handwritten Notes

Heat And Mass Transfeer

By- Negi Sir

- Colour Print Out
- Blackinwhite Print Out
- Spiral Binding,& Hard Binding
- Test Paper For IES GATE PSUs IAS, CAT
- All Notes Available & All Book Availabie
- Best Quaity Handwritten Classroom Notes & Study Materials
- IES GATE PSUs IAS CAT Other Competitive/Entrence Exams

Visit us:-www.hindbookcenter.com

Courier Facility All Over India
(DTDC & INDIA POST)
Mob-9654451541

Hindbookcenter

GET IT ON Google Play

MADE EASY , IES MASTER, ACE ACADEMY, KREATRYX

ESE , GATE,PSUs BEST QUALITYTOPPER HAND WRITTEN NOTESMINIMUM PRICE AVAILABLE @ OUR WEBSITE

1. ELECTRONICS ENGINEERING
2. ELECTRICAL ENGINEERING
3. MECHANICAL ENGINEERING
4. CIVIL ENGINEERING
5. INSTRUMENTION ENGINEERING
6. COMPUTER SCIENCE

IES ,GATE , PSU TEST SERIES AVAILABLE @ OUR WEBSITE

- IES –PRELIMS & MAINS
- GATE

➢ NOTE;- ALL ENGINEERING BRANCHS

➢ ALL PSUs PREVIOUS YEAR QUESTION PAPER @ OUR WEBSITE

PUBLICATIONS BOOKS -

MADE EASY , IES MASTER ,ACE ACADEMY ,KREATRYX ,GATE ACADEMY, ARIHANT ,GK

RAKESH YADAV, KD CAMPUS ,FOUNDATION , MC –GRAW HILL (TMH) ,PEARSON...OTHERS

HEAVY DISCOUNTS BOOKSAVAILABLE @ OUR WEBSITE

Shop No.7/8 Saidulajab Market Neb Sarai More, Saket, New Delhi-30 9654451541	Shop No: 46 100 Futa M.G. Rd Near Made Easy Ghitorni, New Delhi-30	F518 Near Kali MaaMandir Lado Sarai New Delhi-110030	F230, Lado Sarai New Delhi-110030

Website: www.hindbookcenter.com
Contact Us: 9654451541

Difference b/w Thermodynamics & Heat transfer

$1000^{\circ}C \longrightarrow 25^{\circ}C$

$m = 1000\ kg$, $c = 450\ J/kg\text{-}K$

Heat transfer

$20^{\circ}C$

$Q = mc\Delta T_{1-2}$

$Q = mc(T_2 - T_1)$

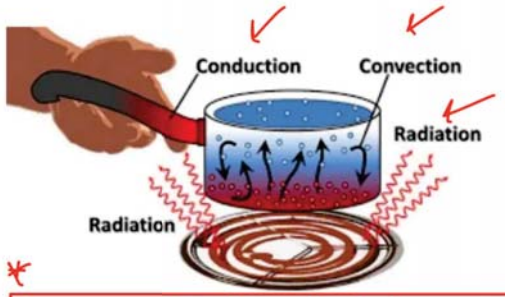
$Q = 1000 \times 450 \times (25 - 1000)$

$Q = -438750\ kJ$ Rejected / Lost

J or kJ

$\dot{Q}$

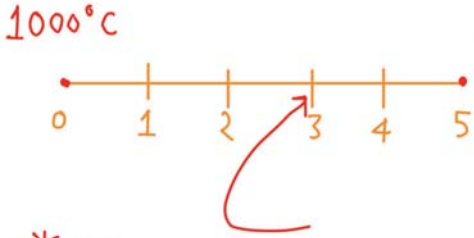
Rate of Heat transfer / Heat transfer rate / Heat Flow rate



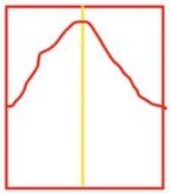
* Mode of Heat transfer

Conduction | Convection | Thermal Radiation

$1000^{\circ}C \xrightarrow{5\ hrs} 25^{\circ}C$



* Temperature after certain length of time



* Temperature Distribution

* Thermodynamics Subject

- Heat transfer (Q) ⟶ J or kJ

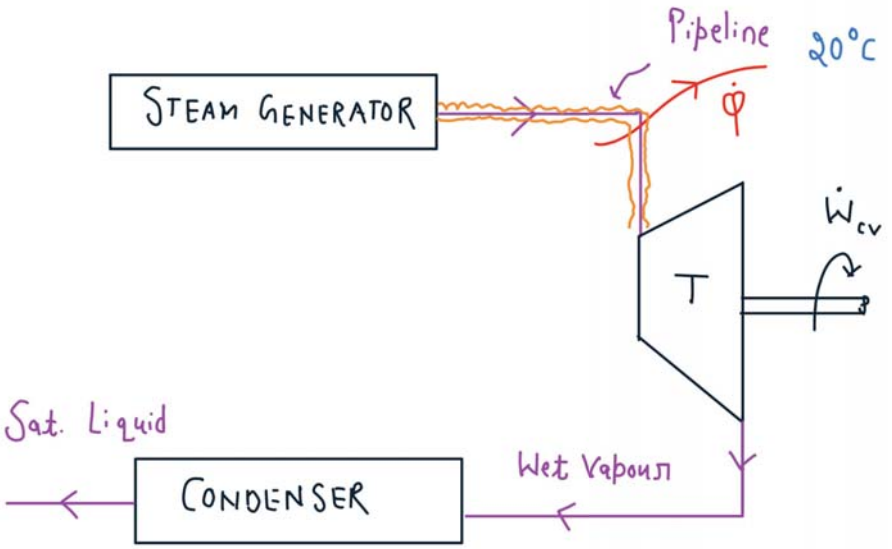
- Heat transfer Subject

Rate of heat transfer ($\dot{Q}$) ⟶ W or kW

- Whenever two systems at different temperatures are brought into contact, heat transfer takes place.
- Thermodynamics subject deals with the amount of heat transfer from one equilibrium state to another equilibrium state.
- Units of heat transfer used in thermodynamics are Joule (or) Kilojoule.

Heat transfer subject deals with,

- Rate of heat transfer or heat flow rate
- Mode of heat transfer (conduction, convection, thermal radiation).
- Temperature after certain length of time before the equilibrium is achieved.
- Temperature distribution within the body.
- The units of heat flow rate used in heat transfer subject are Watt (or) Kilowatt.



Practical applications of heat transfer related to Mechanical engineering

Practical applications of heat transfer related to Mechanical engineering

- Calculation of thickness of insulation, for the pipes carrying steam from steam generator to steam turbine.
- Designing of condenser.
- Designing of furnaces used for heat treatment processes such as annealing, normalizing and tempering etc.
- Designing of cooling fan, for various transistors mounted over electronic chip.

Content

1. Basic Concepts
2. Conduction
   - Cartesian Coordinates
   - Cylindrical Coordinates
   - Spherical Coordinates
3. Fins
4. Heat Exchangers
5. Unsteady State Heat Conduction / Transient Heat Conduction
6. Thermal Radiation
   - Basic Laws
   - Radiation Heat transfer
7. Thermal Convection
   - Forced Convection
   - Free Convection
   - Boiling & Condensation

Weightage

GATE ⟶ 5M to 6M

ESE Pre ⟶ 10 to 12

GATE - 2022 ME

- FN ⇒ 2x1M, 3x2M
- AF ⇒ 2x1M, 3x2M

8M

References

- Principles of Heat and Mass transfer by **Incropera and Dewitt** — Wiley Publication — Concepts
- Heat and Mass transfer Fundamentals & Applications by **Yunus A. Cengel & Afshin J. Ghajar** — McGrawHill — Practice
- Heat and Mass transfer by **Dr. D.S. Kumar** — S.K. KATARIA & SONS