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(1)

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COURSE - Mechanical Engineering

COURSE CODE - MEC-129.

⇒ ⇒ Final - ASSESSMENT ⇒ ⇒

Answer to the Question No-1:

□ Ans: Mechanical Engineering - Technically Mechanical Engineering is the Application Of the principles and problem-solving techniques Of Engineering From design to Manufacturing to the Market place for any Object.

Mechanical Engineering analyze their work using the principles of Motion, Energy, and force - Ensuring that designs function safely, efficiently and reliably, all at a Competitive Cost.

Mechanical Engineering make a difference. That's because

Mechanical engineering careers center on creating technology to meet human needs. Virtually every product our service in most Modern life has probably been touched in some way by Mechanical engineer to help humankind.

This include Solving today's problems and creating future Solution in the health care, energy, transportation.

②

World hunger, space exploration, climate change and more.
Being ingrained in my challenges and innovation across my

Field means a Mechanical Engineering - education is vital.

To meet this broad demand, Mechanical engineers may

Design a Component, a ~~sub~~ Mechanism a System or a

process. This ranges from the macro to the micro

from the largest system like cars and satellites.

to the smallest Component like sensors and

switch. Any thing that needs to be

Manufactured - indeed anything with moving

parts - need the Expertise of a mechanical

Engineering.

Answer to the Question No - 2

(3)

Ans: Seven type of mechanical Engineering: —

(1) Mechanics:

→ Definition — Mechanics is the fundamental branch of Mechanical engineering that deals with the study of forces and their effects on matter.

→ Key Concepts: Statics — focuses on Objects at Rest, analyzing force and Moments with out considering Motion. Dynamic: involves studying Objects in Motion, considering forces, acceleration, and energy.

→ Application: Structural analysis of building and - Bridges. Designing Mechanical Component for stability and durability.

② Thermodynamics:

→ Definition: Thermodynamics explores energy transfer and its effect on the physical properties of substances.

→ Key Concept: Law of Thermodynamic: Describes the relationships between energy, heat and work, Heat Transfer: studies the movement of heat between system.

→ Application: Designing energy-efficient engineering and power plants. Developing heating, ventilation and air conditioning (HVAC) system.

③ Mechatronics:

Mechatronics integrates mechanical Engineering with electronics and Computer Science to create intelligent system and product.

④ Robotics:

Robotics focus on the design, construction and operation of robots enhancing automation and human-machine interaction.

(5) Aerospace Engineering: Aerospace engineering deals with the design and development of aircraft, spacecrafts and related systems. Study of the behavior of air as it interacts with solid object.

(6) Material Science Engineering: Material engineering science explores the properties of materials and their application in various fields, including mechanical engineering.

(7) Acoustical Engineering: Acoustical engineering involves the study and control of sound and vibration. Behavior propagation and characteristics of sound waves, Noise Control.

(1)

(2)

Answer to the Question No - 3

Answer: Here are some common challenges mechanical engineers may encounter in their jobs, along with potential solutions to help you find ways to overcome with them →

- Licenses and certifications.
- project deadlines.
- Safety -
- Equipment malfunctions -
- scope of responsibilities -
- New technologies.
- Complex projects.
- Communication.

(7)

Answer to the Question No-24

Ans: The Second Law of thermodynamics

→ The Second^{Law} thermodynamic gives more information about thermodynamic process.

→ Second law may be defined as

" Heat can not flow it self from colder body to a hotter body "

→ The Second law is also used to determine the theoretical limits for the performance of mostly used engineering system like heat engines and heat pump.

The Second law of thermodynamics introduces a new property call Entropy, S , which is an Extensive property of a system. The entropy change of a closed system is equal to the heat added Reversibility to it divided by the absolute temperature of the system.

(8)

Answer to the Question - No - 5.

Answer: Typical Content of a process flow Diagram —

Typically, process flow diagram of a single unit process include the following —

→ process piping

→ Major Equipment items.

→ Connection with other Systems.

→ Major bypass and recirculation (recycle) streams.

→ Operation data (temperature, pressure, mass, flow, rate, density etc) often by stream references to a mass balance.

→ process stream names.

→

Process flow diagrams generally do not include:

→ pipe classes or piping line numbers.

→ Instrumentation details.

→ Minor bypass line.

→ Instrumentation.

→ Controllers like Level Control or flow Control.

→ Isolation and shutoff valves.

→ Maintenance vents and drains.

→ Relief and safety valves. → Flanges.