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8th Batch
CSE

Course: Mechanical Engineering
course code: MEC-129

Ans: p. the: 9: NO: 01

Ans Mechanical Engineering: Technically Mechanical Engineering is the application of the principles & problem-solving technical of Engineering from design to manufacturing to the market place for any object. Mechanical engineering analyze their work using the principles of motion, energy & force - ensuring that designs function safely, Efficiently & reliably, all at a competitive cost.

Mechanical engineering make a difference. That's because mechanical engineering careers center on creating technologies to meet human needs. Virtually every product our service in modern life has probably been touched been in some way by mechanical engineers to help human kind.

This include solving today's problems creating future solution in the health care, energy transportation.

② World hunger, space exploration, climate change & more being ignored in my challenges & innovation across any field means a mechanical engineering education is very fair. To meet this broad demand, mechanical engineers may design a component, a machine system or a process. This ranges from the macro to the micro from the largest system like cars & satellites, to the smallest component like sensors & switches. Anything that needs to be manufactured - indeed anything with moving parts - need the expertise of mechanical engineering.

Ans: Seven type of mechanical engineering -

① Mechanics:

→ Definition: Mechanics is the fundamental branch of mechanical engineering that deals with the study of force & their effects on matter.

→ Key concept statics: - Focuses on objects at rest, analyzing force & moments with out considering motion. Dynamic! involves studying objects in motion, considering forces, acceleration & energy.

→ Application: structural analysis of building & bridges. Desinging mechanical component for stability & durability.

② Thermodynamics:

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

→ Key concept law of thermodynamics: Describes the relationships between energy, heat & work. Heat transfer studies the movement of heat between system.

④ Application: Designing energy-efficient engineering & power plants, developing heating, ventilation & air conditioning (HVAC) system.

③ Mechatronics: Mechatronics integrates mechanical engineering with electronics & computer science to create intelligent system & product.

④ Robotics: Robotics focus on the design construction & operation of robots enhancing automation & human-machine interaction.

⑤ Aerospace engineering: Aerospace engineering deals with the design & development of aircraft, spacecraft, & related system.

study of the behavior of air as it interacts with solid object.

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⑥ Material Science engineering:

Material engineering science explores the properties of materials & their Application in various field, including mechanical engineering.

⑦ Acoustical engineering: # Involves the study & control of sound & vibration.

Its Behavior, propagation & characteristics of sound waves, noise control.



Ans: Here are some common challenges mechanic engineers may encounter in their job, along with potential solutions to help you find ways to overcome with them —

- Licensure & certifications.
- Project deadlines.
- Safety.
- Equipment maintenance.
- Scope of responsibilities.
- New technologies.
- Complex projects.
- Communication.

Ans: the second law of thermodynamic:

→ The second law thermodynamic gives more information about thermodynamic process.

→ Second law may be defined as

"that 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 engineers system like heat engines & heat pump.

The second law of thermodynamics introduces a new property call entropy, s , which is an extensive property call entropy system. The entropy change of a closed system is equal to the heat added.

Ans: Typical Content of a process flow Diagram -

Typically, process flow diagram of a significant process include the following -

- Process piping.
- Major equipment.
- Connection with other systems.
- Major bypass & recirculation (recycle) streams.
- Operation data (temperature, pressure, mass, flow, Ref. density etc) often by stream references to a mass balance
- Process stream names.

Process flow diagram generally do not include:-

- Pipe classes or piping line numbers.
- Instrumentation details.
- Minor bypass line.
- Instrumentation.
- Controllers like level control or flow control.
- Isolation & shutoff valves.
- Maintenance vents & draining.
- Relief & safety valves.
- Flanges.