**What does a Mechanical Engineering Technologist do?** **TASK 2(EVA)**

Mechanical engineering technologists assist engineers. Also referred to as mechanical engineering technicians, they play a critical role in the design, development and manufacture of mechanical parts, systems and equipment. While mechanical engineers heavily focus their efforts on designing, mechanical engineering technologists use specific technical skills to help build, test and manufacture mechanical devices.

**a)** _____

Employers prefer mechanical engineering technologists who obtained at least an associate degree in mechanical engineering technology or post-secondary training in a similar discipline. Course work includes math, science, fluid mechanics, thermodynamics and computer-aided drafting and design. Along with post-secondary training, employers prefer those who attended an educational program accredited by ABET[1].

**b)** _____

Mechanical engineering technologists assist engineers throughout the design process of mechanical products. They interpret the engineers' specifications to prepare drawings of mechanical products. After understanding the engineers' design, they use software to create blueprints and specifications, and create a process for the manufacturing team to assemble the products designed by engineers.

**c)** _____

After the design process, mechanical engineering technologists work with other employees to streamline the manufacturing process. They often test designs and the materials used to ensure accuracy and functionality. During the manufacturing process, they inspect and test completed mechanical products, document the process and make changes to the assembly and manufacturing of the products as necessary.

**d)** _____

In 2013, O*NET projected slower than average growth for mechanical engineering technologists between 2010 and 2020. About 16,800 job openings are projected during that timeframe or 3 to 9 percent growth. The U.S. Bureau of Labor Statistics (BLS) suggests the overall decline in manufacturing in the United States will contribute to slow growth. The best job prospects are expected in industries that remanufacture products to reduce waste and costs. The alternative energy industry is also expected to grow, opening job

[1] **ABET** (**Accreditation Board for Engineering and Technology)** is a non-governmental organization that accredits post-secondary education programs in applied and natural science, computing, engineering, and engineering technology.

opportunities for mechanical engineering technologists. In 2012, the BLS[2] estimated an average salary of $53,830 per year for these professionals.

**e)** _____

A mechanical engineer uses computer software programs to design or redesign various types of mechanical devices, such as engines, machines and robots. While technical abilities and math skills are vital to success, top mechanical engineers also possess certain personal qualities. These are:

**f)** _____

Engineering is a field of innovation. Mechanical engineers develop new equipment and products used by customers to optimize production or improve their work processes. Creativity is an essential part of developing or improving devices so they are of good quality, meet space or weight limitations and achieve the cost objectives of customers. Much of the development process involves brainstorming new ideas and testing them through trial and error.

**g)** _____

You must also have strong communication skills to meet the needs of clients and other stakeholders. In an engineering firm, you must listen effectively to managers to understand their directions and carry them out properly. You must also articulate the progress of a project and provide accurate information on any issues that appear. If you work independently, or interact with clients, you need to understand client requirements, ask appropriate questions, and provide updates as you work toward development and production goals. In a supervisory position you might also lead a team that helps with research and design, so you must be able to communicate the goals of the project.

**h)** _____

Mechanical engineers are, above all else, problem solvers. They use math skills and analytical abilities to spot problems and resolve them. This is important in the development process so you can ensure that the devices you create do what clients need them to do. It is also important when you are called on to repair problems with existing devices. For example, you might have to recalibrate testing equipment, fine-tune specifications or adjust materials used in production to get the desired results.

**i)** _____

While some mechanical engineers are born with important personal characteristics, many develop both technical and personal skills during college. The standard requirement for a mechanical engineer is a bachelor's degree in the field. You can also earn a m aster's degree in mechanical engineering if you want

[2] **BLS**: In the USA: **Bureau of Labour Statistics**

to get into higher-level positions or management. Some schools have combination programs that let you earn undergrad and graduate degrees in five to six years.

**j)** _____

Mechanical engineers often work with heavy equipment, power tools, motors, technical instruments, toxic substances, powerful machinery and volatile materials, so their work environment is susceptible to fires, explosions, structural failures and equipment malfunctions. Safety measures are vital to a mechanical engineer's job success.

**k)** _____

Developing and testing mechanical prototypes is an exciting part of the job, but it often involves pressing the boundaries of what tools, machinery and equipment can do. Mechanical engineers must test the limits to make sure equipment is functioning properly, has fully developed safety measures and is ready for commercial use. They often use electric generators, internal combustion engines, industrial production equipment, power tools, elevators and conveyor systems to build and test engines and machines, according to the Bureau of Labor Statistics. Sharp blades, running belts, high-powered equipment, metal cutters, and drills expose mechanical engineers to many types of injuries and accidents on the job.

**l)** _____

Mechanical engineers don't just work in testing laboratories. They often work on site at locations that aren't well-suited to the job demands. For example, a mechanical engineer might need to address railcar problems in a subway while passengers and crew members anxiously await assistance. Or, an engineer might be hired to work on equipment that is confined to a small space with limited accessibility. As a result, engineers must prepare for unexpected situations by applying security measures all the time. They might not be aware of leaky hoses, structural flaws, or dangerous situations until they arrive on location and are asked to troubleshoot problems.

**m)** _____

Mechanical engineering isn't for the weak of heart because hydraulics, pumps, turbines, compressors, and pneumatics systems are used on a regular basis to develop and test materials. Mechanical engineers design equipment and systems that serve industries such as aerospace, building construction, biotechnology, aircraft development, marine vessel construction, fuel processing, transportation and energy production.  Because these types of equipment often involve the use of gases, flames, heat, refrigeration and electricity, engineers must use face masks, flame-retardant suits, protective eyewear and gloves to ensure their safety. Even the slightest mistake can lead to burns, cuts, gas inhalation and exposure to hazardous materials.

Mechanical engineers often work with machinery and equipment that is heavy  and structurally unstable. They might injure their backs trying to secure equipment or stabilize materials, crush their hands or fingers trying to work in tight spaces or injure their faces, heads, eyes or toes when they are not wearing proper protective equipment.

While much of a mechanical engineer’s work is done on a computer and in an office setting, they also spend time around dangerous tools and machines and hazardous chemicals at job sites and in laboratories.

**n)** _____

When developing, testing and manufacturing new designs, mechanical engineers work with and around many types of machinery and equipment. This includes generators and other power-producing equipment, manufacturing equipment such as conveyor systems and machine tools, robots used in production and other industrial equipment. Mechanical engineers also may come into contact with dangerous chemicals including cleaning solutions, paint and other surface finishes.

**o)** _____

Some areas of a work site or laboratory require the use of personal protective equipment as required by the Occupational Safety and Health Administration. For example, laser glasses must be used in areas where lasers are in use. Safety glasses are necessary when there is flying debris, chemical fumes or liquid chemicals or acids. Earplugs protect an engineer's hearing in areas where the equipment or machinery is very loud. Hard hats provide additional protection from falling objects. Mechanical engineers must wear steel-toed shoes when there is a danger from falling or rolling objects or hazards that may pierce the sole. Engineers must keep personal protective equipment clean and in good working order. If personal protective equipment is damaged, it must be replaced.

**p)** _____

Pressurized gas systems, such as air compressors, present a potential hazard. In addition to the high pressure, some of these systems are flammable. Eye protection must be used when operating pressurized systems. Compressed gas never should be aimed at another person or used on clothing. Vacuum systems also store a large amount of energy and may cause injury.

**q)** _____

Although mechanical engineers encounter hazardous chemicals less frequently than other potential dangers, they still must take safety precautions to avoid exposure or skin contact. In addition to using the required personal protective equipment, each work site or laboratory must have material safety data sheets for all chemicals and materials used on the site. The material safety data sheets contain information about the effects of exposure and what to do in case of exposure to each chemical. All chemicals must be identifiable with a clear label.

**r)** _____

All workers, including mechanical engineers, must keep all work areas clean and free of unnecessary hazards. Debris should be cleaned up and kept clear of walkways. Hoses should be elevated above workers or covered with a crossover plank. All spills must be promptly cleaned. Emergency exits and access to fire alarms must be kept clear.

**Task: The following headings are missing in the text. Read it carefully and place the headings in the corresponding paragraphs.**

1- Careers and salary _____
2- Unpredictable scenarios _____
3- Communication _____
4- Background _____
5- Gaining qualifications _____
6- Personal protective equipment _____
7- Dangers in mechanical engineering _____
8- Creativity _____
9- Problem-solving _____
10- Pressurized gas and vacuum systems _____
11- Hazardous chemical exposure _____
12- Unchartered waters _____
13- Fire suits aren´t just for firemen _____
14- General safety considerations _____
15- What are the dangers of being a Mechanical Engineer? _____
16- What are the three personal characteristics of a Mechanical Engineer? _____
17- Working with design _____
18- Development during the manufacturing process _____

Q2-Complete:

Another term for Mechanical Engineer Technologist is Mechanical Engineer

Q3-**Is it true or false?**

Mechanical Engineer Technicians assist Engineers.

Q4-**Is it true or false?**

In the development process, Mechanical Engineers don´t test ideas through trial and error.

Q5-**Is it true or false?**

A Mechanical Engineer is required to have a bachelor´s degree.

Q6-**Look for the synonyms for the following words. Use the words that are in bold on the text.**

Skills: help/aid: fabricate/produce:

attend: all over:

obtain building plan:

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Mechanical engineering technologists **assist** engineers **throughout** the design process of mechanical products. They interpret the engineers' specifications to prepare drawings of mechanical products. After understanding the engineers' design, they use software to create **blueprints** and specifications, and create a process for the manufacturing team to assemble the products designed by engineers.

After the design process, mechanical engineering technologists work with other employees to streamline the **manufacturing** process. They often test designs and the materials used to ensure accuracy and functionality. During the manufacturing process, they inspect and test completed mechanical products, document the process and make changes to the assembly and manufacturing of the products as necessary.

| manufacturing | get | blueprint | throughout | assist | go to | competence |
|---|---|---|---|---|---|---|

**Q7-**What are the qualities a mechanical engineer should have? Why?

**Q8-**Look for synonyms for the following words. Use the words in bold int the text:

| | | |
|---|---|---|
| directions: | requirements: | lead: |
| issues: | updates: | research: |

You must also have strong communication skills to meet the needs of clients and other stakeholders. In an engineering firm, you must listen effectively to managers to understand their **directions** and carry them out properly. You must also articulate the progress of a project and provide accurate information on any **issues** that appear. If you work independently, or interact with clients, you need to understand client **requirements**, ask appropriate questions, and provide **updates** as you work toward development and production goals. In a supervisory position you might also **lead** a team that helps with **research** and design, so you must be able to communicate the goals of the project.

| Matter | investigation | instructions | news | requisite | guide |
|---|---|---|---|---|---|

Q9-Why are safety measures important for Mechanical Engineers?

Q10-What does the idiom *unchartered water*s mean?

*Unchartered Waters*

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a. clean water

b. a situation that is dangerous

c. a situation that is unfamiliar to you

Q11-What does the verb address mean on the following sentence?

Mechanical engineers don't just work in testing laboratories. They often work on site at locations that aren't well-suited to the job demands. For example, a mechanical engineer might need to **address** railcar problems in a subway while passengers and crew members anxiously await assistance. Or, an engineer might be hired to work on equipment that is confined to a small space with limited accessibility. As a result, engineers must prepare for unexpected situations by applying security measures all the time. They might not be aware of leaky hoses, structural flaws, or dangerous situations until they arrive on location and are asked to troubleshoot problems.

- a. to direct a speech or statement to
- b.to deal with or discuss
- c. the proper name or title for use in speaking or writing to a person
- d. a usually formal speech or written statement

Q12-Match the object with its name

LASER GLASSES FLAME RETARDANT SUIT COMPRESSOR FACE SHIELD

PUMP TURBINE