

## **First Semester Exam- Answer Key**

### **Exercise 01 : (6 pts)**

1-As cities grow, **engineers** must **design** systems to support the increasing **population**. Urban development relies on engineers to create roads, **public utilities**, and buildings that improve the quality of **life**.

2- **Infrastructure** refers to the basic physical and organizational structures needed for a **society** to **function** effectively

3- The **sub-base** layer is the backbone of the **road's** structural integrity. It consists of materials like **crushed stone** or gravel, which are laid out to create a stable surface that **supports** the weight of the **pavement** and traffic.

### **Exercise 02 : (10 pts)**

**Write T(True) or F ( False) and correct the false statement.**

1- Engineers plan and design systems for water, electricity, and waste management. **T**

2- The binder layer is made from a mixture of **sand and water**, providing a **thin**, robust layer that supports the top layers of pavement. **F**

The binder layer is made from a mixture of aggregate and oil, providing a thick, robust layer that supports the top layers of pavement.

3- Engineering plays a vital role in shaping the infrastructure of modern cities. **T**

4- Proper compaction of the sub-base is critical, as any weak spots can lead to pavement failure. **T**

5- The pavement is the **bottom** layer of the road structure. **F**

The pavement is the **top** layer of the road structure.

6- The pavement has no role in protecting the underlying layers of the road . **F**

The pavement **protects** the underlying layers of the road.

7- The **first** step in road construction is the rolling process. **F**

The **final** step in road construction is the rolling process.

8- Limited budgets are one of the challenges engineers encounter when designing projects. **T**

9- Engineers **never** face time constraints as a challenge when designing projects. **F**

Engineers **often** face time constraints as a challenge when designing projects.

10- One of the most visible contributions of engineering to urban life is the creation of infrastructure. **T**

### **Exercise 03 : (04 pts)**

The main networks of infrastructure we need to improve our lives:

1- Sanitation networks

2- Drinking water networks

3- Communication networks

4- Roads and transportation systems