

<b>Name:</b>	
<b>Enrolment No:</b>	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, Dec 2019**

**Course: IOT Based Smart City**  
**Program: B.Tech EE IOT**  
**Course Code: ELEG 393**  
**Max. Marks: 100**

**Semester: VII**  
**Time 03 hrs.**

**Instructions: Attempt all questions.**

**SECTION A**

S. No.	Question	Marks	CO
Q 1	As technology gets smarter, will our abilities to think, feel and act be affected? Briefly justify your answer with an example.	5	CO1
Q 2	Discuss (point-wise) the technical constraints of a feasible IoT based sensor network?	5	CO2
Q 3	Differentiate between IoT and M2M?	5	CO1
Q 4	Discuss the following terms with respect to Internet of Things (IoT): a) Ubiquitous networking; b) Classification of objects/things; c) Classification of sensors; d) Converged network.	5	CO3

**SECTION B**

Q 5	Discuss the importance of Cloud storage and computing in IoT applications for smart cities.	10	CO3
Q 6	Name all organizations and International Regulators that defines and governs IoT standards? Discuss the benefits of gaining standardization in IoT?	10	CO4
Q 7	Explain the basic architecture of IoT Network. What are the main internal components of an IoT device?	10	CO2
Q 8	Discuss, how safeguarding of user data and privacy can be achieved in IoT?	10	CO3

**SECTION-C**

Q 9	<p>Design an IoT System that can be used in Home Security (Smart Homes)? Analyze the following:</p> <ul style="list-style-type: none"> <li>a) Features and specifications,</li> <li>b) Wireless standards that can be implemented,</li> <li>c) Appropriate network topologies, and</li> <li>d) Real-world design constraints.</li> </ul>	<b>20</b>	<b>CO3</b>																																				
Q 10 A	<p>Table 1 shows the smart environment application domains for which an IoT application is to be planned. Fill the details that can contribute in design process of these applications.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="border: none;"></th> <th style="border: none; text-align: center;">Smart Agriculture/Forest</th> <th style="border: none; text-align: center;">Smart Water</th> <th style="border: none; text-align: center;">Smart transportation</th> </tr> </thead> <tbody> <tr> <td style="border: none;">Network Size</td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Users</td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Energy</td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Internet connectivity</td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Data management</td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">IoT Devices</td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Bandwidth requirement</td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Example testbeds</td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> </tbody> </table> <p align="center"><i>Table 1: Smart environment application domains</i></p>		Smart Agriculture/Forest	Smart Water	Smart transportation	Network Size				Users				Energy				Internet connectivity				Data management				IoT Devices				Bandwidth requirement				Example testbeds				<b>10</b>	<b>CO3</b>
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Q 10 B	<p>Design an IoT based application for any one of the three domain areas (shown in Table 1). Provide all details of your design along with supporting diagram.</p>	<b>10</b>	<b>CO3</b>																																				