Final Assessment Test (FAT) - May 2024

Programme	**B.Tech.**	Semester	**WINTER SEMESTER 2023 - 24**
Course Title	**WEARABLE COMPUTING**	Course Code	**BCSE315L**
Faculty Name	**Prof. Sathian D**	Slot	**E1+TE1**
		Class Nbr	**CH2023240501898**
Time	**3 Hours**	Max. Marks	**100**

General Instructions:

- Write only Register Number in the Question Paper where space is provided (right-side at the top) & do not write any other details.

Answer all questions (10 X 10 Marks = 100 Marks)

01. Internet of things (IoT) based devices are considered to be the most preferred type of wearable field devices. Draw a basic block diagram of a wearable device. Elaborate in detail how wearable devices such as smart watches are utilizing the concept of IoT for its functioning. **[10]**

02. In a health care monitoring system for patients with critical illness, continuous error free data transferring is required. For transferring data between personal computers and wearable systems the communication is taken through Bluetooth Low Energy (BLE) to avoid such errors. Justify the reason why BLE type of communication is preferred for wearable system in such applications and detail about its working. **[10]**

03. The different functions of wearable system depend on Body Sensor Network system (BSN). Interaction between each BSN is carried out through standard network topologies. Classify the different categories of network topologies and elaborate about those topologies in detail using a diagram. **[10]**

04. Several human body parameters are required to be monitored for sports persons to analyze about their strength and weakness in their playing style. Customized wearable devices with Body Sensor Network (BSN) are developed nowadays using SPINE architecture for these applications. As a first stage of customized product development rapid prototyping of BSN is carried out using the SPINE architecture. Discuss in detail about that SPINE framework using its middle ware architecture diagram based on the given scenario. **[10]**

05. Summarize the integration process of body sensor network data collection with a cloud environment to address the challenge of real-time data collection for continuous health monitoring applications. Additionally, provide details about its functions, accompanied by a clear diagram. **[10]**

06. Wearable smart watches and fitness tracker uses step counting system for users to analyze their physical activity. Elaborate in detail how a spine based activity recognition is used for counting the steps that works in a fitness tracker and wearable smart watches. **[10]**

07. While using wearable devices and gadgets for video gaming applications, certain procedural steps are required to be followed for running a simple desktop applications using SPINE 1.3 in a wearable computing architecture, list out those steps involved for carrying out basic functionalities in an experimental framework. [10]

08. Wearable device manufacturers are using different commercial sensor node platforms with different micro controllers and memory organizations. Suggest any two commercial sensor node platform that is most suitable for basic body parameter measurements such as temperature and blood pressure, also explain about those two commercial sensor node platform in detail. [10]

09. Smart wearable belts are functioning under the concept of autonomic physical activity recognition system. Summarize and detail its functionality with neat diagrams. [10]

10. Consider a case study of an athlete who needs to monitor his physical activity on day today basis. Suggest a wearable device to monitor his activity in terms of running and skipping of that athlete. Justify your selection and provide a detailed explanation of its functionality with neat diagram. [10]