First Semester 2022-2023 COMPREHENSIVE EXAMINATION

Course No. : EE ZG523/ ME XR510/ EC WF576 **Course Title** : Embedded Systems
Nature of Exam : Closed Book **Weightage** : 40% **Duration** : 2½ Hours **Date of Exam** :
Sunday, 27/11/2022 (FN) **No. of Pages** = 1 **No. of Questions** = 3

Q.1 Answer the following questions related to Embedded System Architecture: (a)
Explain the role of RTOS in embedded systems. Provide examples. (b) What is the
difference between microcontrollers and microprocessors? (c) Discuss the significance of
power optimization techniques in embedded devices. (d) Why is memory management
crucial in embedded systems? Explain with case studies. (e) How does an interrupt-driven
system enhance real-time performance? [15]

Q.2 Answer the following questions related to Communication Protocols: (a)
Compare UART, SPI, and I2C protocols in embedded systems. (b) How does CAN bus
improve communication in automotive systems? (c) What are the advantages of using
wireless protocols like Zigbee in IoT? (d) Explain the role of edge computing in embedded
devices. (e) Discuss the limitations of Bluetooth Low Energy (BLE) in industrial
applications. [15]

Q.3 State True or False providing due justification for your answers: (a) An
embedded system always requires an operating system. (b) ARM processors are used
only in mobile devices. (c) High-speed embedded systems do not require power
management techniques. (d) Embedded systems cannot support multitasking. (e) IoT
devices always use cloud computing for data processing. [10]