

**GANPAT UNIVERSITY****B. Tech. Semester: VII Electronics & Communication Engineering****Regular / Remedial Examination Nov – Dec 2016****2EC704 Elective I (A) Embedded Systems****Time: 3 Hours****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

**SECTION-I**

- Que. – 1 (A)** Define the following terms: 5
1. CPU utilization
  2. Response time
  3. Turnaround time (TAT)
  4. Throughput rate
  5. Pre-emption
- (B)** Draw state transition diagram of a Task/Process and explain each state in brief. 4
- (C)** List out and explain various ways to download the Hex file to the Nonvolatile memory. 3

**OR**

- Que. – 1 (A)** Define the following terms: 5
1. Completion time
  2. Deadline
  3. Run time
  4. Tardiness
  5. Laxity
- (B)** Explain sequence of actions in Remote Procedure Call. 4
- (C)** Write conversion steps from source file to an executable file. 3
- Que. – 2 (A)** List out features, characteristics and applications of embedded systems. 4
- (B)** Write short note on Pre-emptive Shortest job next for Preemptive methods of Scheduling with example. 4
- (C)** Write short note on the earliest deadline first algorithm with example. 3

**OR**

- Que. – 2 (A)** Enlist and explain figures of merit for an embedded system. 4
- (B)** Write short note on the Priority-based Scheduling for Non-preemptive methods of Scheduling with example. 4
- (C)** Write short note on the Rate monotonic algorithm with example. 3
- Que. – 3 (A)** Write short note on the LCD and Stepper motor. 6
- (B)** Which are the steps to be taken into consideration when there is the need to design systems which are power limited? 2
- (C)** List out popular IDEs. 2
- (D)** List out qualities of a good RTOS. 2



**SECTION-II**

- Que. – 4 (A) Write the short note on the following External bus: 6
1. RS 232
  2. SPI
- (B) Which are the features of ARM that make it special? 4
- (C) Explain about Daisy chaining arbitration scheme. 2

**OR**

- Que. – 4 (A) Write the short note on the following wireless protocols: 6
1. Wireless LAN (WLAN)
  2. USB
- (B) Enlist all advanced features of ARM core and explain any four of them. 4
- (C) Explain about Distributed arbitration by self-detection scheme. 2

- Que. – 5 (A) For the 32-bit constant generated by each of the following rotations 4
1. Rotate 0x40, to the right 30 times
  2. Rotate 0x56, to the left 12 times
- (B) How is the effective memory address calculated in the following load and store instructions? 4
1. LDR R4, [R3, R2]
  2. STR R5, [R4, R3, ASL #4]
- (C) Why does FIQ set another set of registers? 3

**OR**

- Que. – 5 (A) For the 32-bit constant generated by each of the following rotations 4
1. Rotate 0x05, to the right 6 times
  2. Rotate 0xFC, to the right 2 times
- (B) How is the effective memory address calculated in the following load and store instructions? 4
1. LDR R3, [R2, LSL #2]
  2. STR R9, [R1, R2, ROR #2]
- (C) Discuss for three profiles of ARM CORTEX. 3

- Que. – 6 (A) Give the differences between Harvard, Super Harvard and Von Neumann architecture. 3
- (B) Discuss the principle of Watchdog Timer. 3
- (C) What is the reason for the shift from parallel to serial buses in embedded systems? 3
- (D) How the ARM becomes a microcontroller unit? 3

**END OF PAPER**