

Total No. of Questions : 10]

SEAT No. :

P1344

[Total No. of Pages : 3

[4858] - 1088

**T.E. (Computer Engineering) (Semester - II)**

**Embedded Operating Systems**

**(2012 Pattern) (End Sem.)**

**Time :  $2\frac{1}{2}$  Hours]**

**[Max. Marks : 70**

**Instructions to the candidates:**

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume suitable data if necessary.

**Q1) a)** With the help of a diagram explain the classification of real-time scheduling methods. **[6]**

b) Explain role of barrel shifter in the ARM. **[4]**

OR

**Q2) a)** Write an ARM assembly program to find value of expression  $3X + 6Y + 9Z$ , where  $X = 4$ ,  $Y = 5$ ,  $Z = 3$ . **[6]**

b) Explain how embedded operating systems are different than desktop operating systems? **[4]**

**Q3) a)** Write short notes on (any two): **[6]**

i) LSB.

ii) OSDL.

iii) Kernel command line processing.

b) Differentiate between 'NOR' Flash & 'NAND' Flash. **[4]**

OR

**P.T.O.**

- Q4)** a) Why Embedded Linux is popular as OS for embedded system development? [4]
- b) Write short note on (any two): [6]
- i) BusyBox.
  - ii) Subsystem Initialization.
  - iii) init thread.

- Q5)** a) What are the challenges for bootloader in embedded system? [6]
- b) Explain about U-boot configurable commands. [5]
- c) Enlist device driver module utilities and explain the use of same. [6]

OR

- Q6)** a) Show the structure of PCI configuration header. [6]
- b) Explain the JFFS2 file system. [5]
- c) Write short notes on (any two): [6]
- i) MTD.
  - ii) TFTP server.
  - iii) DHCP server.

- Q7)** a) Explain the tracing and profiling tools used in Embedded Application development. [6]
- b) Explain the working of stepper motor? State any two applications of stepper motor in embedded systems. [6]
- c) Draw & explain KGDB setup for kernel debugging. [5]

OR

- Q8)** a) Give different ways of debugging embedded applications. [4]
- b) With a neat diagram explain the graphics display of data in embedded systems. [7]
- c) Write short notes on (any two): [6]
- i) GStreamer Media framework.
  - ii) OpenGL ES.
  - iii) ssh.

- Q9)** a) Explain architecture of Android with neat diagram. [8]
- b) Write short notes on (any two): [8]
- i) Porting Linux application.
  - ii) Zygote.
  - iii) System server.

OR

- Q10)** a) Give the latency components in Linux with neat diagram. [8]
- b) Explain Android booting process with neat diagram. [8]

