



M.E DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2014)

Second Semester

APPLIED ELECTRONICS

P14AETE35: Embedded Systems in Automotive Applications

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Matching the following

[K₁]

List I		List II	
A. Intel 8051 RAM		i. 512 bytes	
B. Intel 8096 RAM		ii. 8 Kilo bytes	
C. Intel Pentium Data Cache		iii. 256 bytes	
D. Motorola M68HC11E2 RAM		iv. 128 bytes	

- | | A | B | C | D |
|----|-----|-----|-----|---|
| a) | iv | ii | iii | i |
| b) | ii | iii | iv | i |
| c) | iv | iii | ii | i |
| d) | iii | iv | ii | i |

2. The common practice for testing ignition coils is

[K₁]

- | | |
|-------------------------------|---------------------|
| a) Spark-gap tester | b) Neon-tube tester |
| c) High-frequency coil tester | d) Oscilloscope |

3. Increase in plate area of the battery cell increases

[K₂]

- | | |
|---------------|----------------|
| a) Current | b) Voltage |
| c) Resistance | d) Capacitance |

4. The process of scanning each and every peripheral connected to the processor to test whether there is any data transfer essential is called

[K₂]

- | | |
|------------|--------------|
| a) Polling | b) Interrupt |
| c) Thread | d) Task |

5. Exceptions are _____ [K₁]
a) Hardware interrupts b) Software interrupts
c) Tasks d) Pipes
6. ARM 9 has a _____ stage pipeline [K₁]
a) Five b) Three
c) Two d) Six
7. _____ is essential for downloading monitor and ROM images into EPROM [K₂]
a) Connector b) Socket
c) Display d) Monitor Segment
8. Most commonly used engine coolant temperature sensor is [K₁]
a) Thermocouple b) Thermistor
c) Thermopile d) Pyrometer.
9. A program that translates assembly language software in to machine codes is called [K₁]
a) Compiler b) Interpreter
c) Assembler d) Linker
10. Sharing of two semaphores creates [K₂]
a) Dead lock b) Spin lock
c) Time out d) None of the above

PART B (10 x 2 = 20 Marks)

11. How does a DSP differ from a General Purpose Processor? [K₃]
12. List out the applications of flash memory. [K₂]
13. Define the term interrupt latency. [K₁]
14. Mention the functions of a kernel. [K₂]
15. What is a target system? How does it differ from an embedded system? [K₃]
16. State the purpose of a simulator during development phase. [K₂]
17. Compare lead acid batteries with alkaline batteries. [K₃]
18. Mention the limitations of an ignition coil system. [K₁]
19. Enumerate the features supported by vehicle infotainment systems. [K₂]
20. Why is CAN bus most popularly used in automotive electronics? [K₂]

PART C (10 x 5 = 50 Marks)

21. Explain the electronic fuel control unit with a suitable sketch. [K₂]

22. Discuss the various classifications of memories. [K₁]
23. Compare the features of RISC and CISC processors. [K₃]
24. How does a task differ from a function and ISR? [K₃]
25. Define context switching. Specify its advantages. [K₁]
26. Explain the hardware and software tools needed for development phase of an embedded system. [K₂]
27. What are the components of an emulator? List out the advantages of using an ICE. [K₁]
28. Discuss the various comfort and safety systems in an automobile. [K₂]
29. Compare the features of various vehicle communication protocols [K₃]
30. Discuss the principle of operation of various sensors employed for measuring engine temperature in an automobile. [K₂]

PART D (2 x 10 = 20 Marks)

31. Explain the features of RTOS μ COS - II operating system. Discuss the use of multiple semaphores for synchronizing tasks. [K₂]
32. Explain in detail about pipelining and super-scalar processing. Also discuss in detail about pipeline hazards with suitable examples. [K₂]
