

**15EC561**

**Visvesvaraya Technological University, Belagavi**

**MODEL QUESTION PAPER**

**5<sup>th</sup> Semester, B.E (CBCS) EC/TC**

**Course: 15EC561- Automotive Electronics (Open Elective)**

**Time: 3 hrs.**

**Max. Marks: 80**

**Note: (i) Answer Five full questions selecting any one full question from each Module.  
(ii) Question on a topic of a Module may appear in either its 1<sup>st</sup> or 2<sup>nd</sup> question.**

**Module-1**

1. **a.** Briefly explain the four stroke cycle of an IC Engine, with neat diagrams. **(08 Marks)**  
**b.** Define the Engine performance terms Power, BSFC, Torque and Volumetric Efficiency with relevant formulae and their units. **(08 Marks)**

**OR**

2. **a.** Explain Spark Plug configuration, spark pulse generation and Ignition Timing with relevant diagrams. **(08 Marks)**  
**b.** What are the major controller inputs and outputs from/to Engine? Show their connection between Engine and Controller. **(08 Marks)**

**Module-2**

3. **a.** Explain the working of Mass Flow Sensor with relevant diagram. **(08 Marks)**  
**b.** Explain EGR actuator control with a relevant diagram. **(08 Marks)**

**OR**

4. **a.** Explain the working of Magnetic reluctance position sensor with relevant diagram. **(08 Marks)**  
**b.** Explain the working of Fuel Injector and pulse mode fuel control signal with relevant diagrams and waveforms. **(08 Marks)**

**Module-3**

5. **a.** What are the seven modes of fuel control? Explain Idle Air Control with relevant diagrams. **(08 Marks)**  
**b.** What are the various digital modules in the Control Unit? Write a Block diagram depicting those modules. **(08 Marks)**

**OR**

6. **a.** What is the use of Secondary Air? With the help of a diagram explain how the secondary air is controlled. **(08 Marks)**  
**b.** What are the various modules of Control unit Software? Explain them briefly. **(08 Marks)**

**Module-4**

7. **a.** What are the CAN protocol layers? What are the four different frames? Write the message format. **(08 Marks)**  
**b.** Explain Digital Cruise control system with the help of a relevant diagram. **(08 Marks)**

**OR**

8. **a.** Give examples for each of CAN and LIN applications. Write a note on Diagnostic interfaces. **(08 Marks)**  
**b.** Explain Antilock Braking System with relevant diagrams. **(08 Marks)**

**Module-5**

9. **a.** Write brief notes on On-Board-Diagnostics and Off-Board-Diagnostics. **(08 Marks)**  
**b.** Explain Collision Avoidance Radar warning system with relevant diagrams. **(08 Marks)**

**OR**

10. **a.** Explain Accelerometer based Air bag system with relevant diagrams. **(08 Marks)**  
**b.** Explain low tire-pressure warning system with relevant diagrams. **(08 Marks)**

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**Visvesvaraya Technological University, Belagavi**  
**MODEL QUESTION PAPER**  
**5th Semester, B.E (CBCS) EC/TC**

**Course: 15EC562 - Object Oriented Programming Using C++ (Open Elective)**

**Note: (i) Answer Five full questions selecting any one full question from each Module.**

**(ii) Question on a topic of a Module may appear in either its 1<sup>st</sup> or 2<sup>nd</sup> question.**

**Time: 3Hrs**

**Max. Marks: 80**

<b>MODULE - 1</b>			
1	a.	Explain the structure of C++ program. Mention applications of C++ programming language.	6
	b.	List Different data types used in C++. Give example for each data type.	6
	c.	What are variables? With syntax explain declaration and initialization of variables in C++.	4
<b>OR</b>			
2	a.	Mention different types of operators used in C++. Explain increment and decrement operators with example.	5
	b.	What are Control structures? Write a simple C++ program to demonstrate for loop.	5
	c.	How objects are passed as parameters to the member functions of a class? Discuss with example.	6
<b>MODULE - 2</b>			
3	a.	What is class? Write a program to create a class called employee consisting of name, designation, id and salary as class variables. Using this class print 5 employee information by reading the information of employee.	8
	b.	What are access specifiers? How many access specifiers are used in C++? Explain with example for each.	8
<b>OR</b>			
4	a.	Why Friend function is required? Write a program to add two complex numbers using Friend functions.	8
	b.	Define class and object. How arrays are used within class? Demonstrate with sample program.	8
<b>MODULE - 3</b>			
5	a.	Define constructor? How constructors are different from methods or member functions, illustrate with example.	6

	b.	What is operator overloading? Write a C++ program to add two complex numbers by overloading + operator.	6
	c.	What is the use of Destructor in C++? How it is different from Constructor, explain in brief.	4
<b>OR</b>			
6	a.	Write a class Rectangle containing two data items length and breadth and four methods setdata, getdata, display and area to set the length and breadth to get the user inputs, to display and to find the area of rectangle respectively. Also write the main program to declare objects and use member functions of the class.	10
	b.	What is a copy constructor? Illustrate the working of copy constructors.	6
<b>MODULE - 4</b>			
7	a.	What is inheritance? Explain different types of inheritance. How inheritance is done using multiple base classes? Demonstrate.	10
	b.	Write a C++ program which uses the concept of simple inheritance. What is a file? Explain file open and close functions with arguments.	6
<b>OR</b>			
8	a.	How the concept of polymorphism is incorporated in C++? Explain with example.	8
	b.	What is virtual function? How it is different from pure virtual function? Illustrate.	4
	c.	Explain this pointer used in functions of a class.	4
<b>MODULE - 5</b>			
9	a.	List and explain the classes used for file stream operations.	8
	b.	Explain the working of formatted and unformatted functions used in C++.	8
<b>OR</b>			
10.	a.	Write a program to copy content of one file into another file until end of file is reached. Display the copied content on the output screen.	8
	b.	How file opening and closing is done? What are the functions required for reading and writing data in a file. Explain in brief EOF.	8

**Visvesvaraya Technological University, Belagavi**

**MODEL QUESTION PAPER**

**5<sup>th</sup> Semester, B.E (CBCS) EC/TC**

**Course: 15EC563- 8051 Microcontroller – Open Elective**

**Note: (i) Answer Five full questions selecting any one full question from each Module.**

**(ii) Question on a topic of a Module may appear in either its 1<sup>st</sup> or 2<sup>nd</sup> question.**

**Time: 3 Hours**

**Max. Marks: 80**

<b>Module-1</b>			
1	(a)	(i) Differentiate between Microprocessor and Microcontroller.	4
		(ii) What is an Embedded system & Embedded Microcontroller?	2
	(b)	Sketch the internal block diagram of 8051 Microcontroller and explain its architecture briefly.	10
<b>OR</b>			
2	(a)	Explain the functions of the 4 I/O ports of 8051.	4
	(b)	Explain the organization of the internal RAM memory of 8051.	4
	(c)	Interface external ROM & RAM to 8051 & explain briefly how to access them.	8
<b>Module-2</b>			
3	(a)	Explain the 4 data addressing modes of 8051 with an example for each.	6
	(b)	Indicate whether the following instructions of 8051 are valid or not. If not valid, give reason	6
		(i) MOV #50H, R1	
(ii) ADD @R2, 40H			
(iii) MOV R1, R2			
(iv) XCHG R1, R2			
(v) MUL A, R1			
(vi) DEC DPTR			
(c)	Explain the Shift and Rotate instructions of 8051 with an example.	6	
<b>OR</b>			
4	(a)	Explain the jump instructions of 8051 with their ranges of jump. If a backward jump to be performed to an instruction situated at -4 bytes, which jump instruction is preferred and why?	6
	(b)	Write an ALP to find the value of the expression $S = ((P * Q) - 30H)$ . Values of P and Q are stored in the internal memory at locations 20H and 21H. Store the 16 bit value of S at 22H and 23H internal memory locations.	6
	(c)	(i) Explain the logical AND instruction with all the possible addressing modes with an example for each.	3
(ii) Write an ALP to test whether the content of internal memory location 20H is Even / Odd. If even store EEH, otherwise 00H in the internal memory location 21H.		3	

<b>Module-3</b>			
5	(a)	Write an ALP to find the sum of Ten 8 bit numbers stored in the internal memory block starting with address 20H. Store the 16 bit sum at the end of the block after last data.	8
	(b)	Interface a simple ON/OFF switch and a simple LED to 8051 and write an ALP to switch ON/OFF LED, if the switch in ON/ OFF.	8
<b>OR</b>			
6	(a)	(i) Explain the operation of PUSH & POP instructions and LCALL & RET instructions of 8051.	4
	(b)	Write an ALP to find N! of a given 8 bit number stored in the internal memory location 20H. Store result in internal memory location 21H. Assume value of N! does not exceed 8 bit.	6
	(c)	Interface a simple LED to 8051 and write an ALP to switch it ON/OFF depending on whether the content of the internal memory location 20H is 01H or 00H.	6
<b>Module-4</b>			
7	(a)	Explain the principle of operation of 8051 Timer/ Counter and its Mode-1 & Mode-2 operations.	8
	(b)	Write 8051 C program to send message GOOD serially at a baud rate of 4800 with 1 stop bit and 8 data bits. Assume the crystal frequency as 11.0592 MHz.	8
<b>OR</b>			
8	(a)	Explain the principle of operation of Serial port of 8051 to Transmit or Receive a character serially.	6
	(b)	Write an ALP to generate square wave of 1 KHz on pin P1.1. Assume crystal frequency as 11.0592 MHz.	8
	(c)	How to Start/Stop a Timer of 8051 and to Read the present count of Timer while it is counting?	2
<b>Module-5</b>			
9	(a)	Explain the Interrupt system of 8051.	6
	(b)	Interface 8051 to a Stepper Motor and write an ALP to rotate it 4 steps clockwise.	8
	(c)	What are the sequence of steps 8051 has to perform in order to convert an analog signal into digital using ADC 804?	4
<b>OR</b>			
10	(a)	Write an ALP to generate a square wave of 2KHz on pin P1.2 using an interrupt generated from Timer-0 of 8051.	8
	(b)	Interface an LCD to 8051 and write an ALP to display the message GO on line 1 using delay.	8

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