**VIII Semester B.E. Examination**

**18EECO403**

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**May\_2019**

**(Electronics & Communication Engineering)**

**Automotive Electronics(18EECO403)**

**Duration: 3 hours Max. Marks: 100**

**Note:** ***i)*** *Answer any TWO full questions from UNIT-I, any TWO full questions from UNIT-II and any ONE full question from UNIT-III.*

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| **UNIT-I** | | | |
| 1 | a. | With a block diagram explain how emission control is done in automobile. | (08marks) |
|  | b. | Derive the expression for mass air flow using speed density method | (06marks) |
|  | c. | Imagine a car is traveling at a speed of 100mph and has a wheel radius of 18inchs with 4500rpm. Suddenly an obstacle comes and driver applies a break, calculate the amount of slip. | (06marks) |
| 2 | a. | Engine control system is responsible for controlling fuel and ignition for all possible engine operating conditions. Suggest various control modes of fuel under different operating conditions. | (08marks) |
|  | b. | Discuss the configurations of Hybrid electric vehicles. | (06marks) |
|  | c. | What is engine mapping? Explain the affects of air fuel ratio and spark timing of engine performance. | (06marks) |
| 3 | a. | What are under steering and over steering conditions. Write a suitable algorithm to avoid these conditions. | (08marks) |
|  | b. | Discuss the I/O parameters and variables of Engine ECU. | (06marks) |
|  | c. | Explain the driving factors for automotive industry. | (06marks) |
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| 4 | a. | Explain the arbitration mechanism used in CAN protocol. Discuss the master window lifter controller using CAN protocol. | (08marks) |
|  | b. | Identify the sensor used to measure the throttle angle and explain its operation. | (06marks) |
|  | c. | Explain the operation of EGR actuator. | (06marks) |
| 5 | a. | Identify the sensor which works in the principle of piezoresistivity. With the neat sketch explain its operation.. | (08marks) |
|  | b. | Exxplai the flexray node communication with a block diagram. | (06marks) |
|  | c. | Discuss the process of retarding the excessive knock in the engine. | (06marks) |
| 6 | a. | Explain the operation of sensor used to measure the amount of oxygen content in exhaust gas with neat diagram. | (08marks) |
|  | b. | Discuss the master slave communication of LIN protocol. | (06marks) |
|  | c. | How the message frame transmission takes place in MOST protocol. | (06marks) |
| **UNIT-III** | | | |
| 7 | a. | Explain the following ADAS systems  i) Lane departure warning ii) Pedestrain protection. | (08marks) |
|  | b. | Describe ISO 26262 functional safety standard. | (06marks) |
|  | c. | With a block diagram explain the adaptive cruise control. | (06marks) |
| 8 | a. | Distinguish between onboard and offboard diagnostics. Explain various safety norms and standards for automotive systems. | (08marks) |
|  | b. | Explain the diagnostic tools used in autmotive. | (06marks) |
|  | c. | Discuss KWP 2000 diagnostic protocol. | (06marks) |

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| School/Department: E&C Sem: VIII Sub-Name: Automotive Electronics Sub-Code: 18EECO403 Faculty Name: Kiran M R | | | | |
| **Q.No** | **Blooms Learning Levels (LL)** | **Course Outcomes (CO’s)** | **PI codes** | **Marks** |
| 1a | 2 | 1 | 1.3.2 | 8 |
| b | 2 | 2 | 1.4.4 | 6 |
| c | 3 | 2 | 2.1.2 | 6 |
| 2a | 3 | 2 | 2.1.2 | 8 |
| b | 2 | 1 | 1.4.4 | 6 |
| c | 2 | 2 | 1.4.4 | 6 |
| 3a | 3 | 2 | 2.1.2 | 8 |
| b | 2 | 2 | 1.4.4 | 6 |
| c | 2 | 1 | 1.4.4 | 6 |
| 4a | 2 | 1 | 1.4.4 | 8 |
| b | 2 | 3 | 2.1.2 | 6 |
| c | 2 | 3 | 1.4.4 | 6 |
| 5a | 2 | 3 | 1.4.4 | 8 |
| b | 2 | 1 | 1.4.4 | 6 |
| c | 2 | 3 | 1.4.4 | 6 |
| 6a | 2 | 3 | 1.4.4 | 8 |
| b | 2 | 1 | 1.4.4 | 6 |
| c | 2 | 1 | 1.4.4 | 6 |
| 7a | 2 | 4 | 1.4.4 | 8 |
| b | 2 | 4 | 1.4.4 | 6 |
| c | 2 | 4 | 1.4.4 | 6 |
| 8a | 2 | 4 | 1.4.4 | 8 |
| b | 2 | 4 | 1.4.4 | 6 |
| c | 2 | 4 | 1.4.4 | 6 |
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**Examination Section**

**End Semester Assessment Question Paper Review**

Set 1 / Set 2 / Set 3

Programme. BE Course:Automotive electronics Course Code:18EECO403

Duration: 3 Hrs Semester:VIII

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| SL. No. | Criterion | Self Review  (Yes/No/NA/) | Expert Review  (Yes/No/NA/) |
| 1] | Whether the following details are mentioned correctly on the Header of the question paper (Exam month and year etc up to instructions)? | Y |  |
| 2] | Whether the question paper covers the entire syllabus (unit wise) as announced in the scheme of ESA at the end of prescribed syllabus for this course? | Y |  |
| 3] | Whether the pattern of question paper is in accordance with the model question paper? | Y |  |
| 4] | Whether marks distribution is proper for all the questions and sub questions? | Y |  |
| 5] | Whether the question paper has all the required data and figures? If figures exist, mention the number of figures in the paper. | Y |  |
| 6] | Mention the time required for an average student to answer this paper (in minutes) | 180min |  |
| 7] | How many corrections you have made in the print copy of the question paper (typographical errors etc)? | N |  |
| 8] | Whether the scheme is ready along with the paper? | Y |  |
| 9] | Whether the scheme contains marks splitting along with points? | Y |  |
| 10] | a) How many numerical problems are there in the question paper? | 1 |  |
| b) How many worked out solutions exist in the scheme? | 1 |  |
| 11] | Is the Q.P previewed for printing & verified for corrections? | Y |  |
| 12] | Would you like to do modifications to any of the questions? (only for reviewer) |  |  |
|  | **Name & Signature of Reviewer’s with Date of Review** |  |  |

**Note** :If Yes please fill in the details on the reverse page

To,

**The Controller of Examinations**

**KLE Technological University Hubballi-31**.

Sir,

After scrutinizing I Recommend No **/ Following (Strike out not applicable)** corrections for this paper. The details are as follows:

School/ Department:­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Course­:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Paper Code: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Course Code: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Correction No** | **Unit No** | **Question & Sub Questions** | **Existing Question** | **Suggested Change** | **Reasons for Change** |
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Date of Scrutiny:\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature of Scrutinizer:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name of the Scrutinizer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_