**20CE105**

**Hall Ticket Number:**

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| **I/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **July, 2021** | **Civil Engineering** | | |
| **First Semester** | **Electrical Technology & Mechanical Technology** | | |
| **Time:** Three Hours | | **Maximum:**70 Marks | |
| *Answer Question No.1 compulsorily.* | | | (14X1 = 14 Marks) |
| *Answer ONE question from each unit.* | | | (4X14=56 Marks) |

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| 1 | Answer all questions | | | (14X1=14 Marks) | |
|  | a) | | Define Electric Power. | |  |
|  | b) | | Write the differences between DC and AC. | |  |
|  | c) | | What are the applications of transformer? | |  |
|  | d) | | State Kirchhoff’s current law. | |  |
|  | e) | | What are different types of alternators? | |  |
|  | f) | | Why single-phase induction motors are not self-starting. | |  |
|  | g) | | What is sag? | |  |
|  | h) | | What do you mean creep in belts? | |  |
|  | i) | | Write the formulae for power transmitted by a belt. | |  |
|  | j) | | What are the advantages of the Casting Process? | |  |
|  | k) | | What is centrifugal tension in a belt? | |  |
|  | l) | | What are the main components of an IC engine? | |  |
|  | m) | | What is the function of the carburettor | |  |
|  | n) | | Write a short note on combustion process in IC engine. | |  |
| **UNIT I** | | | | | |
| 2. | | a) | What are different circuit elements? And explain them. | | 7M |
|  | | b) | With the help of a neat circuit diagram and waveforms, explain the operation of a half-wave rectifier. | | 7M |
| **(OR)** | | | | | |
| 3. | | a) | What is a transformer? And give its constructional details. | | 7M |
|  | | b) | Explain the principle of operation of a DC generator. | | 7M |
| **UNIT II** | | | | | |
| 4. | | a) | Explain the working principle and operation of the alternator. | | 7M |
|  | | b) | Describe the construction details of a three-phase induction motor. | | 7M |
| **(OR)** | | | | | |
| 5. | | a) | Derive an expression for sag in a transmission line having equal level supports | | 7M |
|  | | b) | Explain the effect of wind in sag in an overhead transmission line | | 7M |
| **UNIT III** | | | | | |
| 6. | | a) | Explain the process of casting with neat sketches. | | 7M |
|  | | b) | Explain the process of soldering. | | 7M |
| **(OR)** | | | | | |
| 7. | | a) | Explain briefly about open and cross belt drives. | | 7M |
|  | | b) | Derive the expression for the ratio of tensions in flat belt drive. | | 7M |
| **UNIT IV** | | | | | |
| 8. | | a) | Explain the working of the four-stroke petrol engine | | 7M |
|  | | b) | Explain the working principle of CI engine. | | 7M |
| **(OR)** | | | | | |
| 9. | | a) | Explain the operating principle of Single-stage reciprocating air compressors. | | 7M |
|  | | b) | State the applications of Multi-stage reciprocating air compressors. | | 7M |

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