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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| **Date:** 10 – 01- 2025 **Time:** 01:00 pm – 04:00 pm |

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| **School:** SOE & SOCSE | **Program:** B. Tech | |
| **Course Code:** CIV1008 | **Course Name:** Basic Engineering Sciences | |
| **Semester**:I | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **-** | **14** | **34** | **26** | **26** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Answer ALL the Questions. Each question carries 2 marks. 10Q x 2M=20M** | | | | |
| **1** | List any four disruptive technologies that can be seen implemented in smart cities. | **2 Marks** | **L1** | **CO2** |
| **2** | List the anatomy of Smart cities. | **2 Marks** | **L1** | **CO2** |
| **3** | Define potential and kinetic energy. | **2 Marks** | **L1** | **CO3** |
| **4** | What are compressors? List the types. | **2 Marks** | **L1** | **CO3** |
| **5** | What is a pump? List any two applications. | **2 Marks** | **L1** | **CO3** |
| **6** | Define the following terms associated with petroleum E&P activities (i) Exploration and (ii) Appraisal. | **2 Marks** | **L1** | **CO4** |
| **7** | What are the various processes carried out in petroleum industry to extract crude oil? | **2 Marks** | **L1** | **CO4** |
| **8** | List the types of petroleum products derived from crude oil. | **2 Marks** | **L1** | **CO4** |
| **9** | Classify the types of welding. | **2 Marks** | **L1** | **CO5** |
| **10** | Define soldering and brazing. | **2 Marks** | **L1** | **CO5** |

**Part B**

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| **Answer the Questions Total 80 Marks.** | | | | | |
| **11.** | **a.** | Describe the anatomy of smart cities along with its salient features. | **10 Marks** | **L2** | **CO2** |
|  | **b.** | Distinguish between renewable and non-renewable energy sources. Write any five ill effects of the use of non-renewable energy sources. | **10 Marks** | **L4** | **CO3** |
| **Or** | | | | | |
| **12.** | **a.** | Explain the digitalization process in the context of smart cities with the help of a block diagram. | **10 Marks** | **L2** | **CO2** |
|  | **b.** | Explain any two types of renewable energy sources and list any five benefits. | **10 Marks** | **L2** | **CO3** |
|  |  |  |  |  |  |
| **13.** | **a.** | A cart travels along a frictionless roller coaster track. At point A, the cart is 10 m above the ground and traveling at 2 m/s. Calculate the following   1. velocity at point B when the cart reaches the ground. 2. velocity of the cart at point C when the cart reaches a height of 3 m. 3. maximum height the cart can reach before the cart stops. | **10 Marks** | **L3** | **CO3** |
|  | **b.** | Explain the working mechanism of reciprocating compressor with the help of a neat sketch. | **10 Marks** | **L2** | **CO3** |
| **Or** | | | | | |
| **14.** | **a.** | Calculate the electricity bill amount for a month of 31 days, if the following devices are used as specified:   1. 4 bulbs of 20 watts for 7 hours 2. 3 tube lights of 50 watts for 8 hours 3. 1 refrigerator of 350 watts for 24 hours 4. 1 air-conditioner of 3500 watts for 4 hours   Given the rate of electricity is 2 Rs. per unit. | **10 Marks** | **L3** | **CO3** |
|  | **b.** | Explain the features of positive and non-positive displacement pumps. | **10 Marks** | **L2** | **CO3** |

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| **15.** | **a.** | Explain the three key sectors of the petroleum industry based on the primary activities involved in each sector. | **10 Marks** | **L2** | **CO4** |
|  | **b.** | List the key differences between Onshore and Offshore key E&P activities. | **10 Marks** | **L4** | **CO4** |
| **Or** | | | | | |
| **16.** | **a.** | List and describe the main stages of the upstream oil and gas life cycle, explaining the purpose of each stage. | **10 Marks** | **L2** | **CO4** |
|  | **b.** | List the key areas of digitalization in petroleum industry. Also mention any five benefits. | **10 Marks** | **L1** | **CO4** |

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| **17.** | **a.** | Explain the types of metal forming process by plastic deformation. | **10 Marks** | **L2** | **CO5** |
|  | **b.** | In a machining experiment, tool life was found to vary with the cutting speed in the following manner. Determine the exponent (𝑛) and constant (𝐾) of the Taylor's tool life equation.   |  |  | | --- | --- | | **Cutting speed (m/min)** | **Cutting speed (m/min)** | | 60 | 81 | | 90 | 36 | | **10 Marks** | **L2** | **CO5** |
| **Or** | | | | | |
| **18.** | **a.** | What is additive manufacturing? Write the key differences between additive and subtractive manufacturing. | **10 Marks** | **L2** | **CO5** |
|  | **b.** | Briefly explain the evolution of Industry 1.0 to Industry 4.0. | **10 Marks** | **L2** | **CO5** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***