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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| **Date:** 04 - 01- 2025 **Time:** 09:30 am – 12:30 pm |

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| --- | --- | --- |
| **School:** School of Engineering | **Program:** B. Tech – MEC | |
| **Course Code:** MEC2018 | **Course Name:** Value Engineering | |
| **Semester**: VII | **Max Marks**: 100 | **Weightage**:50% |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** |
| **Marks** | **26** | **26** | **24** | **24** |

**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. 10 X 2 Marks=20 Marks** | | | | |
| **1** | What do you mean by “scrap value” of a product? | **2 Marks** | **L1** | **CO1** |
| **2** | Differentiate product and project. | **2 Marks** | **L2** | **CO1** |
| **3** | What is infant mortality in a product life cycle? | **2 Marks** | **L1** | **CO1** |
| **4** | State the purpose of Pareto principle in functional analysis. | **2 Marks** | **L2** | **CO2** |
| **5** | What are the three key questions are addressed in a FAST Diagram? | **2 Marks** | **L1** | **CO2** |
| **6** | What is Job Plan? | **2 Marks** | **L1** | **CO2** |
| **7** | List various costs involved in life cycle cost analysis. | **2 Marks** | **L1** | **CO3** |
| **8** | In what way integrating queuing theory into value engineering will be helpful? | **2 Marks** | **L1** | **CO3** |
| **9** | What are all the three types of artificial intelligence based decision making in value chain? | **2 Marks** | **L1** | **CO4** |
| **10** | What are all the benefits of value engineering in manufacturing? | **2 Marks** | **L1** | **CO4** |

**Part B**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Answer ALL Questions. 4 X 20Marks=80 Marks** | | | | | |
| **11** | **11a** | How will you improve productivity through value engineering? Explain in detail. | **10 Marks** | **L2** | **CO1** |
| **11b** | Discuss various type of skill sets needed for value engineers with suitable explanations. | **10 Marks** | **L2** | **CO1** |
| **or** | | | | | |
| **12** | **12a** | How will you choose a value engineering project? Explain in detail. | **10 Marks** | **L2** | **CO1** |
| **12b** | List and explain various steps in evaluation of value engineering ideas. | **10 Marks** | **L2** | **CO1** |
|  |  |  |  |  |  |
| **13** | **13a** | What is the concept of worth? Execute the Function–Cost–Worth Analysis with a case example. | **10 Marks** | **L2** | **CO2** |
| **13b** | Elaborate with suitable illustrations about the five major steps in the Functional Analysis. | **10 Marks** | **L1** | **CO2** |
| **or** | | | | | |
| **14** | **14a** | Let us assume the case of a car (as a product) and you are asked to execute functional analysis using Function Analysis System Technique (FAST). Draw the FAST diagram for the given case and explain the logic behind the construction in a detailed manner. | **20 Marks** | **L3** | **CO2** |
|  |  |  |  |  |  |
| **15** | **15a** | What are the various techniques used in Value Engineering? Briefly explain. | **10 Marks** | **L2** | **CO3** |
| **15b** | Explain in detail about Steps involved in Monte Carlo simulation method. | **10 Marks** | **L2** | **CO3** |
| **or** | | | | | |
| **16** | **16a** | Arrivals at a phone service facility are considered to be Poisson at an average time of 18 min between our arrival and the next. The length of the service is distributed exponentially, with a mean of 12 min. Determine  (a) Expected fraction of the day that the facility will be in use.  (b) Expected number of units in the queue  (c) Expected waiting time in the queue.  (d) Expected number of units in the system.  (e) Expected waiting time in the system  (f) Expected number of units in queue that from time to time.  (g) What is the probability that an arrival will have to wait in queue for service?  (h) What is the probability that exactly 5 units are in system  (i) What is the probability that an arrival will not have to wait in queue for service?  (j) What is the probability that there are 10 or more units in the system?  (k) What is the probability that an arrival will have to wait more than 30 min in queue for service?  (l) What is the probability that more than 7 units in system. | **20 Marks** | **L3** | **CO3** |
|  |  |  |  |  |  |
| **17** | **17a** | Consider a marketing industry and analyze the application of value engineering in marketing with detailed discussion**.** | **20 Marks** | **L3** | **CO4** |
| **or** | | | | | |
| **18** | **18a** | Explain elaborately about the application of value engineering principles for the case of any project based industry. | **20 Marks** | **L3** | **CO4** |