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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**MAKE-UP EXAMINATION JULY 2024**

**Date**:12/07/2024

**Time**: 1:30 PM to 4:30 PM

**Max Marks**: 100

**Weightage**: 50%

**Semester & AY**: 4& 1 (2023-24)

**Course Code** : MEC 3070

**Course Name:** Electronic Waste Management

**Program & Sem**: B.Tech

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| **Instructions:**1. ***Read the question carefully and answer all the questions***
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**Part A [Memory Recall Questions]**

**Answer any SIX questions. Each Question carries Five marks (6Qx5M= 30)**

1. What is Electronic waste and give the classification of E-waste.

 C.O.NO.1 [Knowledge]

 2. What are the benefits of recycling the e-Waste? C.O.NO.1 [Knowledge]

3. Mention the list out the chemicals and metals of E-waste that causes hazardous impact on health. C.O.NO.1 [Knowledge]

4. What is risk Assessment? List out its sub-processes with suitable example

 C.O.NO.2 [Knowledge]

5. Where do you find the applications of flame retardant? C.O.NO.2 [Knowledge]

6. Thiosulfate leaching process is used for recovery of metals from e-waste. Discuss the advantages and disadvantages involved in Thiosulfate leaching. C.O.No.3[Knowledge]

7. What are Flame Retardants? Describe them in brief, also give examples. C.O.No.3[Knowledge]

8. List out the existing techniques of E-waste recycling techniques C.O.No.3[Knowledge]

**Part B [Thought Provoking Questions]**

**Answer any FIVE Questions. Each Question carries Eight marks (5Qx8M= 40)**

9. Growing range of electronic devices which have been discarded by their users generate E waste. Explain the need of E- waste management C.O.NO.1 [Comprehension]

 10. Harmful chemicals and metals are major concern given with their source in e-waste causing hazardous impact on health. Explain any three harmful elements used in the electronic devices and equipment’s.

 C.O.NO.1 [Comprehension]

 11.E-waste contains hazardous chemical substances and they are harmful to the environment. Explain about the Minamata Incident happened because of Methyl Mercury and write the harmful effects of methyl mercury on human. C.O.NO.2 [Comprehension]

 12.What is CERCLA priority list? Explain any four substances listed in it.

 C.O.NO.2 [Comprehension]

 13. With the schematic flowchart explain the option for recovering of metal from the E-scrap

 C.O.No.3 [Comprehension]

 14.Hydrometallurgical process is used for recovery of precious metal from electronics waste. Explain in detail about Halide Leaching process and it’s chemical reactions. Also explain the limitations of Halide leaching process C.O.No.3 [Comprehension]

**Part C [Problem Solving Questions]**

 **Answer any THREE questions. The Question carries TEN marks (3Qx10M= 30)**

 15. The first attempt in E-waste management is to know how much E-waste is produced.

Explain the different ways to quantifying E-waste. C.O.NO.1 [Comprehension]

 16. An evaluation of personal records of employees of a plant that manufactures white-

 phosphorus revealed that out of 200 workers who were exposed directly to white-phosphorus, 15 were detected to have respiratory tract irritation. The plant also engaged another group of 450 workers who were not exposed to the gas, of which 24 workers were diagnosed with similar respiratory issue. Determine the attributable risk, odds ratio and relative risk of developing respiratory tract irritation due to direct exposure to white-phosphorus. C.O.NO.2 [Application]

17.Huei-Chia Dien Company is into recycling of precious metals out of scrap IC boards from electronics products. Explain the physical separation flow sheet for recycling of scrap IC boards along with neat sketch.C.O.NO.3 [Application]

 18. An evaluation of personal records of employees of a plant that manufactures white-phosphorus revealed that out of 210 workers who were exposed directly to white-phosphorus, 21 were detected to have respiratory tract irritation. The plant also engaged another group of 300 workers who were not exposed to the gas, of which 33 workers were diagnosed with similar respiratory issue. Determine the attributable risk, odds ratio and relative risk of developing respiratory tract irritation due to direct exposure to whitephosphorus C.O.NO.3 [Application]