KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

EMM 512: MANUFACTURING RESOURCES MANAGEMENT

DATE: Tuesday 17th April, 2012 **TIME:** 8.00 a.m. – 10.00 a.m.

Instructions to the candidates: Answer any three questions

1. A growing mechanical manufacturing company needs to recruit a mechanical engineer who will be expected to establish and work as a supervisor of a busy production and assembly department. The engineer is expected to set up a functional team of workers to handle all processes in the department without outsourcing. Discuss how if you are appointed to the position, you would
   a) Carry out job evaluation [5 Marks]
   b) Set up a wage structure based on "Seven point" plan [5 Marks]
   c) Provide an objective job grading system for workers [5 Marks]

2. Allan-Manu Steel Works has set up a subsidiary company in Isiolo's commercial suburb targeting to produce bicycles for export to Ethiopia and Sudan. The new enterprise expects to raise financial resources locally to fund the project.
   a) What would be the possible sources of finance for their business [5 Marks]
   b) Explain the constituents of "direct" and "indirect" materials for the enterprise [5 Marks]
   c) Calculate material cost percentage rate for the first month if they estimate direct material cost to be Kshs 80,000 and workshop overhead for the same month to be Kshs 40,000. [5 Marks]

3. Discuss how the following concepts are applied in a manufacturing enterprise to manage production processes and inventory

   a) Linear programming [5 Marks]

   b) Queuing [5 Marks]

   c) Stock control [5 Marks]

4. At the Apex Steel Cabinet Company, a new CEO was being briefed by the Mechanical Engineering Chief. "Bwana CEO, I hate to protest any budget increase. But I would rather wait until I need it. The Engineering workload often goes down when cabinet sales goes up. That's because marketing pressures us less for new product designs when sales are good. But then, in times of good sales, we have a lot of new design and design modification work. This happens when several key products are in decline phase of their life cycles. So you see, the Mechanical Engineering Department's budget should not depend on corporate forecasts".

   a) Using "Time Series" method, discuss the following as they relate to product manufacturing demands.

      i. Trend [2 Marks]
      ii. Seasonality of a product [2 Marks]
      iii. Cyclic pattern [2 Marks]
      iv. Random events [2 Marks]

   b) From your own understanding explain at least two alternative methods of inventory control that the engineer could adopt to provide stability in his department in times of product demand variation. [7 Marks]

5. Boller Lu Company has finished extension and refurbishing works on its production factory at the EPZ in Nairobi. All the employees are required to be inducted and trained on the use of the new facilities and equipment.

   a) What advantages are to be derived from improving the layout of a manufacturing plant and machinery? [4 Marks]

   b) Discuss four (4) strategies for employee training. [8 Marks]

   c) What factors influence size and frequency of batch production? [3 Marks]