



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING
UNIVERSITY SPECIAL/SUPPLEMENTARY EXAMINATION FOR:
BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING
EMG 2306 : INTRODUCTION TO ENGINEERING DESIGN
END OF SEMESTER EXAMINATION

SERIES: DEC 2016

TIME: 2 HOURS

DATE: Pick Date May 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

a) Elaborate on detail design as a phase in the engineering design process **(14 marks)**

b) List the systematic methods of designing **(6 marks)**

c) Fig 1 (c) shows a CPM network for a design project. The network is drawn with hours indicated for one man power. Activity E has fixed hours irrespective of the man power used. Given manpower of 6 people, redistribute them in order to achieve effective use of time and manpower. Give the solution in the form of a CPM network and show the critical path and its hours the longest loss of time and use of manpower in the network. **(10 marks)**

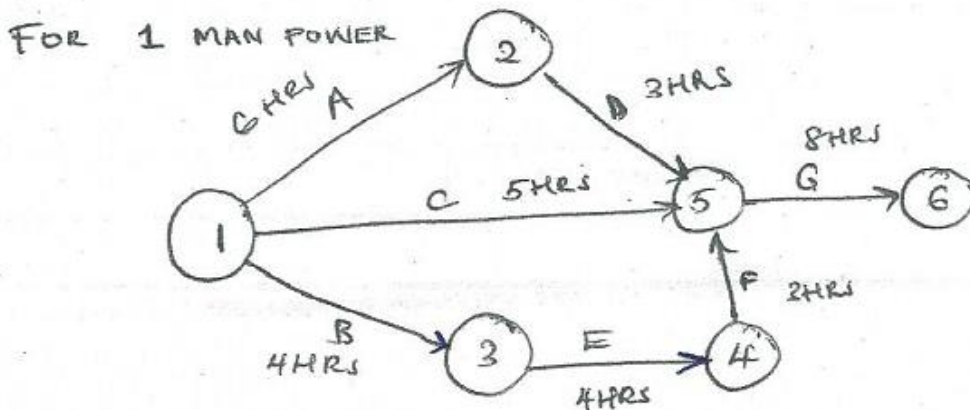


Fig 1(c)

Question TWO

- a) Explain the Material Condition modifiers in Geometric Dimensioning and tolerancing. **(5 marks)**
- b) Discuss the specific rules for the design for manufacture. **(8 marks)**
- c) Discuss the guidelines for tolerance design. **(7 marks)**

Question THREE

- a) Discuss aesthetics and its appeal in engineering design. **(10 marks)**
- b) Discuss 5 characteristics of a good team member and 5 characteristics of a disruptive team member in project planning. **(10 marks)**

Question FOUR

- a) Explain the Break Even Point in the economics of engineering design **(6 marks)**
- b) Tabulate the different costs that go into the overall costs of a new product designed by the industry **(8 marks)**
- c) Discuss the different types of innovation in engineering design. **(6 marks)**

Question FIVE

- a) Explain 8 methods used in minimizing failure in designs **(4 marks).**
- b) Discuss safety and the guidelines for safety in engineering design **(6 marks)**
- c) Discuss five creative thinking methods **(5 marks)**
- d) Explain the different types of designs that exist. **(5 marks)**