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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2016/2017**

COURSE NAME : CNC TECHNOLOGY AND  
CAD/CAM

COURSE CODE : BNM 40204

PROGRAMME CODE : BNM

EXAMINATION DATE : DECEMBER 2016 / JANUARY 2017

DURATION : 3 HOURS

INSTRUCTION : SECTION A : ANSWERS ALL  
QUESTIONS.  
SECTION B : ANSWER **THREE (3)**  
QUESTIONS ONLY.

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THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

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**SECTION A**

- Q1** (a) Referring to the drawing in **Figure Q1(a)**, appraise the suitable cutting method, tools and parameters to machine the mild steel round bar by using CNC lathe machine. The cutting speed apply is 330 m/min and the feedrate is 150 mm/min. The round bar total length is 105 mm. All dimensions unit are in millimeter (mm). (10 marks)
- (b) By applying the information in question Q1(a), construct a CNC lathe program to produce the parts as in the drawing in **Figure Q1(a)**. (10 marks)
- Q2** (a) Referring to the drawing in **Figure Q2(a)**, appraise the suitable cutting method, tools parameters to machine the stainless steel block by using CNC milling machine. The cutting speed apply is 17.6 m/min and the feedrate is 100 mm/min. The end mill tool diameter is 12.5 mm. All dimensions unit are in millimeter (mm). (10 marks)
- (b) By applying the information in question Q2(a), construct a CNC milling program to produce the parts as in the drawing in **Figure Q2(a)**. (10 marks)

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**SECTION B**

- Q3** (a) Identify **FOUR (4)** factors in selecting cutting tools for milling operation. (4 marks)
- (b) Illustrate **TWO (2)** types of direction of cut in milling: (6 marks)
- (c) Distinguish the differences of **TWO (2)** coordinate system apply in CNC milling and lathe machine. (10 marks)
- Q4** (a) Explain the term of manual programming and the advantages of applying it? (4 marks)
- (b) Differentiate the **FOUR (4)** basic terms used in the CNC programming. (8 marks)
- (c) During a profile operation in CNC milling operation using an end mill cutter, it is found that the center of cutting tool move and cut exactly on the part profile line thus effected the size of workpart. As a CNC programmer, decide the best solution to overcome this problem. To support your decision, it should include:
- i) the explanation why this situation happened,
  - ii) the G code applied and
  - iii) illustration. (8 marks)
- Q5** (a) Discuss the advantages of subprograms. (4 marks)
- (b) Identify at least **SIX (6)** some major points of programming upgrading (optimization) a CNC program. (6 marks)
- (c) A CNC machine setup is always take time, therefore setup time is always non-productive as well. As a CNC programmer, construct the machine set up integrity in Order to produce the machine setup time. (10 marks)
- Q6** (a) Identify the differences between DXF and IGES. (4 marks)
- (b) Illustrate the disciplines of CAM. (6 marks)

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- (c) The fundamental concept of CAD/CAM allowed a Computer Aided Drafting (CAD) system to draw the geometry of a workpiece on a computer. By the assist of workpiece sketch, demonstrate how the CAD system could be transferred to Computer-Aided Manufacturing system in order to produce the workpart.

(10 marks)

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**-END OF QUESTIONS -**

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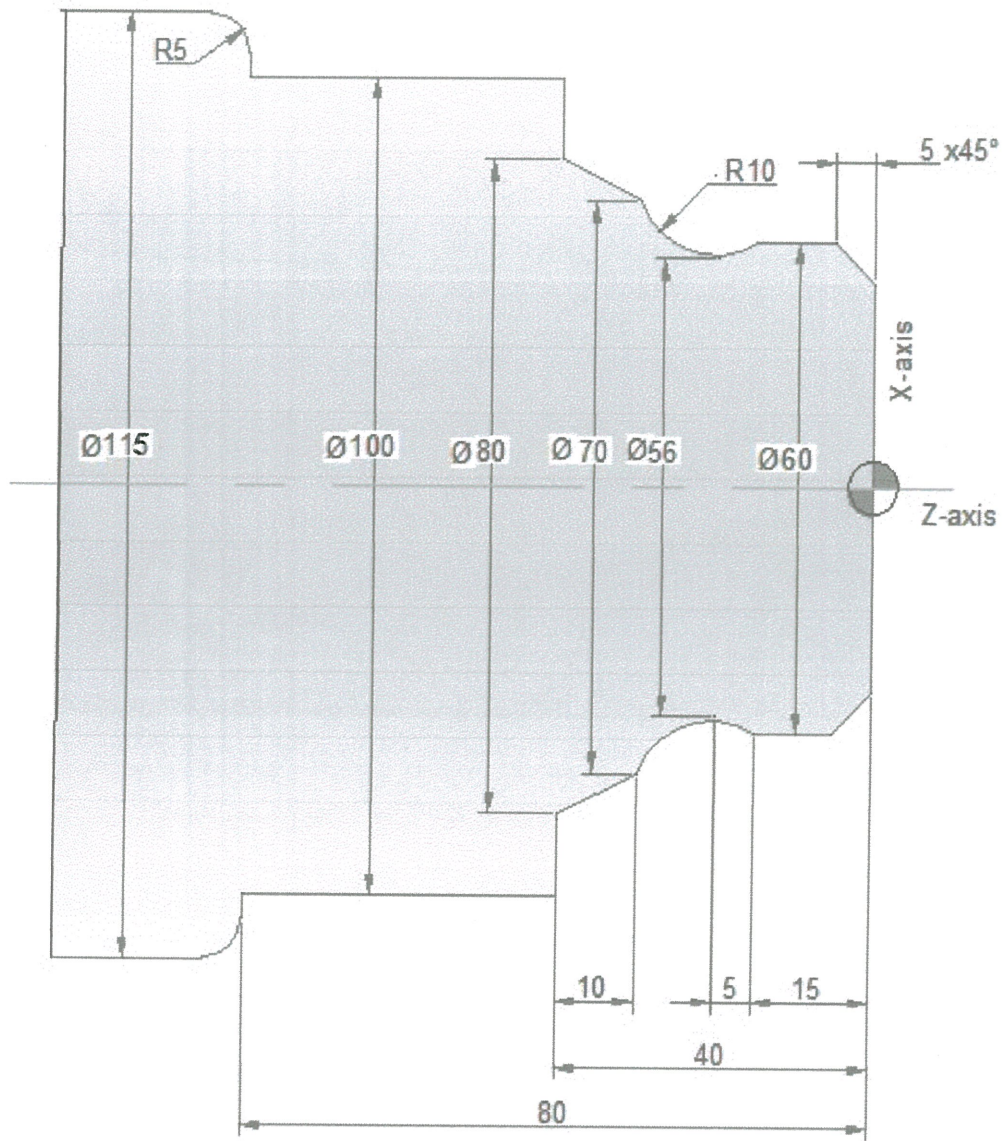


Figure Q1(a)

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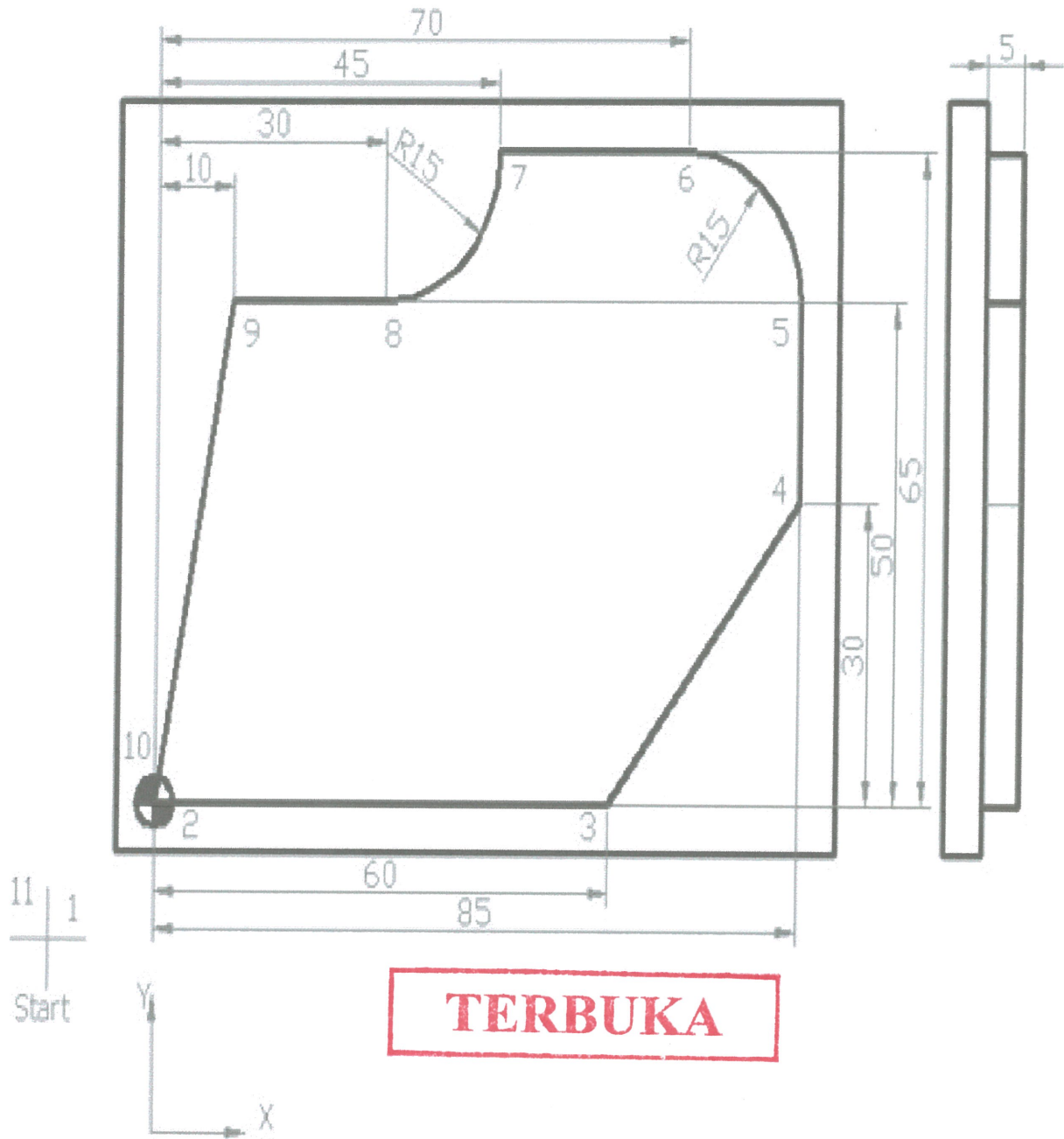


Figure Q2(a)