

INSTRUCTIONS: Answer Question One and any other two questions. Good marks will be awarded to good sketches and expressions

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Question one

- What is manufacturing? (4 marks)
- Enumerate five (5) factors to be Considered when selecting a good milling cutter (5 marks)
- 50 mm diameter **Mild Steel** is to be turned on a lathe machine using a Single -point cutting tools at a speed of 1500rpm with depth of cut of 2mm and feed of 0.5mm/rev. Calculate the:
 - Cutting Speed of the turning operation (3 marks)
 - Volume of metal removed from the mild steel (4 marks)
 - Power required to drive the electric motor (4 marks)(Note: Power constant for a single point turning tool of **Mild Steel** is 1200)

Question Two

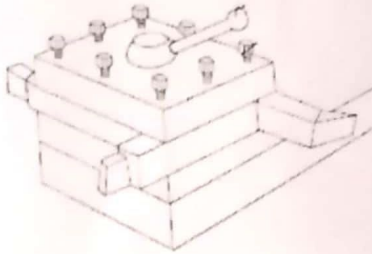
- List four (4) types of Milling machine used in a standard engineering workshop (4 marks)
- Using the principle of metal cutting operation with sketches, explain the principle Up-milling and Down-milling. (6 marks)
- Using neat sketches, explain four (4) operations that can be carried out on milling machine. (10 marks)

Question Three

- With the aid of a well labelled diagram, draw a twist drill and show its nomenclature (6 marks)
- Explain briefly with the aid of sketches the following operations that can be carried out on drilling machine
 - Counter boring (4 marks)
 - Tapping Operation (4 marks)
 - Sport facing (4 marks)
- Calculate the Index arm settings to give 16 equally spaced divisions using a simple indexing. The index plate has the number of hole Circles: 17,19,21,24,29,33,43 and 49 (2 marks)

Question Four

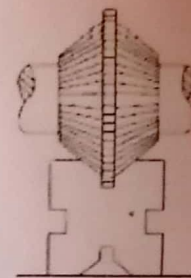
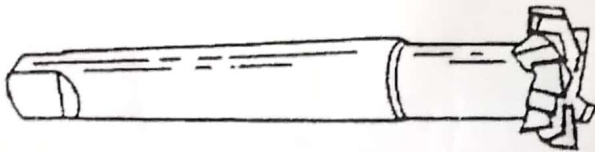
- List five types of drilling machine available in a standard engineering workshop (5marks)
- Using a well labelled diagram, draw a single-point cutting tools showing its geometry (10 marks)
- Identify the following Machine Parts and Machining operation (5marks)



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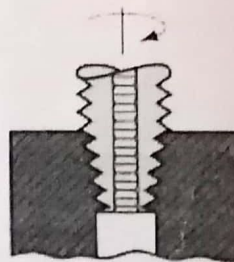
i)

ii) *universal chuck*



ii) *independent chuck*

iv) *Angular*



v) *Turning*

Good luck - Engr. Orisawayi A.O

16
116
232
16