

**BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
DUBAI CAMPUS
WORKSHOP PRACTICE (TA UC112)**

**First Semester 2006-07
Test II (makeup)**

Max. Marks: 30
(Open Book)

Date: 13-12-06
Duration: 50min

Notes:

- Answer all the questions
 - Draw neat sketches wherever necessary
 - Make suitable assumptions if required and clearly state them
-
-

- I. A round rod of diameter to length ratio of 1:5 to be machined into a square rod of the maximum possible dimensions. If the cutting speed is 10m/min and the feed is 2mm/stroke. Also the cutting time to return time ratio is the same as the ratio of the length of the rod to the side of the square. Calculate the total machining time in terms of the diameter "D" mm if the approach and over travel distance is equal to the side of the square and all the faces are machined in a single pass and hence calculate the total machining time if the diameter is 50mm.
- 7 Marks**
2. Given a product, how can you tell that it is manufactured by casting, forging or sheet metal operation? Explain your reasoning.
- 5 Marks**
3. In a tapping operation, is it possible to pull the tap suddenly when tapping is complete? Explain.
- 4 Marks**
4. In a lapping process, why lap is made up of soft material than workpiece? Explain
- 4 Marks**
5. How do you determine whether a defect in a casting is a shrinkage cavity or porosity caused by gases?
- 4 Marks**

6. State whether the italic statements are true /false on the basis of the information given below. Either support or contradict them giving a proper justification.

A cylindrical cup is drawn from a circular sheet metal of radius 5 cm. If the sheet thickness of the cup is 6 mm, then the *clearance between the punch and the die is 3 mm on each side*

4 Marks

7. Give a practical application of the product where hemming is done

1 Mark

8. Which operation is used for providing seating arrangement for the head of screw ?

1 Mark

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WORKSHOP PRACTICE (TA UC112)

First Semester 2006-07
COMPREHENSIVE EXAMINATION (Open Book)

Max. Marks: 75

Date: 18-12-06

Duration: 180min

Instructions.

- Answer all the questions.
- Answer Section I and Section II in separate answer sheets.
- Answer all questions sequentially.
- Draw neat sketches wherever necessary
- Make suitable assumptions if required and clearly state them

Section I

PART A

1. List one component which falls under,
 - a. Mass production.
 - b. Job shop.

2 M
2. For the following applications suggest suitable material giving reasons for your selection.
 - a. Lead screw of the lathe
 - b. Hand wheel in the tail stock
 - c. Air plane body
 - d. Bullet proof jackets
 - e. Shaving blades

5 M.
3. A 40 mm diameter & 200 mm length brass rod was subjected to a tensile load of 40 kN. The extension of the brass rod was found to be 0.254 mm. find the Young's modulus of the bar.

5 M

PART B

4. Differentiate between inspection and measurement.

2 M
5. Give two examples for each and reason for the same :
 - i) Transition fit
 - ii) Clearance fit
 - iii) Interference fit

5 M
6. If the internal diameter of the cylinder is 50mm with an upper deviation of 0.25mm and lower deviation of -0.25mm, fix the dimensions of the piston diameter, hence the maximum tolerance if the maximum gap between the piston and cylinder is 5mm.

5M

PART C

7. A positive rake is better over negative rake- State true or false with reasons.

2 M

8. During a tool life- cutting test, a HSS tool material is used to cut a special die steel, the following values were obtained:

Cutting speed (v) (m/min)	:	55	52	47	44	42
Tool life (T) (hours)	:	4	5	8	10	12

Use the above values to calculate the constants of the tool life equation $v T^n = C$. also determine tool life at a cutting speed of 35 m /min. Solve the problem graphically **6 M**

9. "Heat treatment is a process associated with ferrous materials, whereas there are no significant changes on the properties in Non Ferrous materials" – comment on this statement. **5M**

Section II

PART D

1. Differentiate between Shortest Processing Time (SPT) and Early Due Date (EDD) rules of scheduling. **2M**
2. "Inventory is a blessing in disguise" – comment on this statement. **5M**
3. Illustrate with examples when these rules are used in the manufacturing system. **5M**

PART E

1. With an example differentiate between automation and mechanization. **2M**
2. "In lathe, the - auto feed given by the lead screw is merely a mechanization and not total automation" – comment on this statement. **5M**
3. Classify the following costs into fixed and variable costs

a. Tooling cost	e. Electrical charges
b. Costs of jigs and fixtures	f. Raw material cost.
c. Investment on infrastructure	g. Over head expense
d. Salaries and wages	

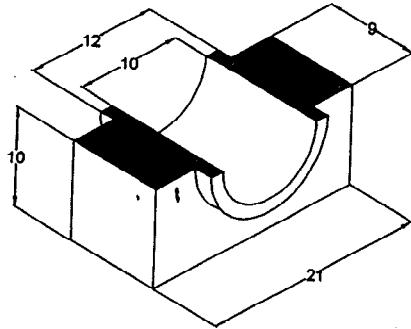
5M

PART F

1. What are the consequences of using the following in arc welding process?
 - h. High current
 - i. High speed and high voltage.
2. The louvers used in the fresh and return air system of the air conditioning plant are manufacturing using sheet metal operation. (Louvers - opening from which the air comes out in the class room). What is the possible sequence of operation used in manufacturing the louvers? **6M**
3. for the component shown below, determine the solid piece pattern dimensions if the allowances are as follow

- j. shrinkage allowance of 3%
- k. Machining allowance of 3mm on each side.
- l. Draft of 1° on the vertical sides.

6M



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WORKSHOP PRACTICE (TA UC112)

First Semester 2006-07
COMPREHENSIVE EXAMINATION (Open Book)

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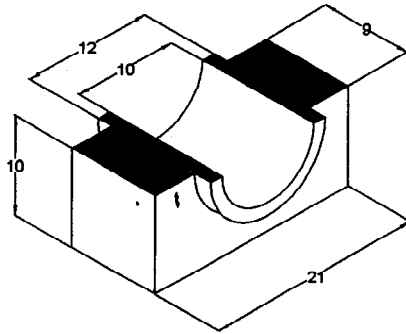
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BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
DUBAI CAMPUS
WORKSHOP PRACTICE (TA UC112)

First Semester 2006-07
Test 1 Makeup (Open Book)

Max. Marks: 25

Date: 08-11-06

Duration: 50min

Notes:

- Answer all the questions
 - Draw neat sketches wherever necessary
 - Make suitable assumptions if required and clearly state them
-
-

1. It is mentioned that *Lathe is the most versatile machine tool and offers more flexibility in terms of the operations that can be performed jobs that can be produced.* It is required to produce jobs shown in Figure 1. Is it possible to produce the jobs shown in Figure 1 on lathe? If yes, explain how it can be done? If no explain why it cannot be made? 5 M

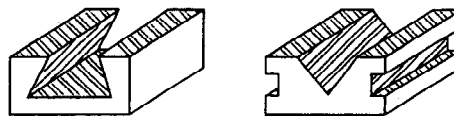


Figure 1

2. Do you think depth of hole can be measured using Vernier Calipers? If yes, explain how it is measured? If no explain why it cannot be measured? 5 M
3. When you sharpen your scissors/ knife you observe sparks. Where as when carryout machining operations such as facing, turning etc. you do not. What is the reason? 5 M
4. We use point cutting tool in lathe and on shaping machines. Operator Mr.X was of the opinion that since both tools are single point tools, he can use the same tool interchangeably on both machines. If you are in charge of workshop, how do you react for his suggestions? Justify your answer. 5 M
5. Give the *sequence of operations* to be performed on the workpiece of dimensions 50 mm \varnothing x 150 mm to produce the part as shown in Fig.2 5 M

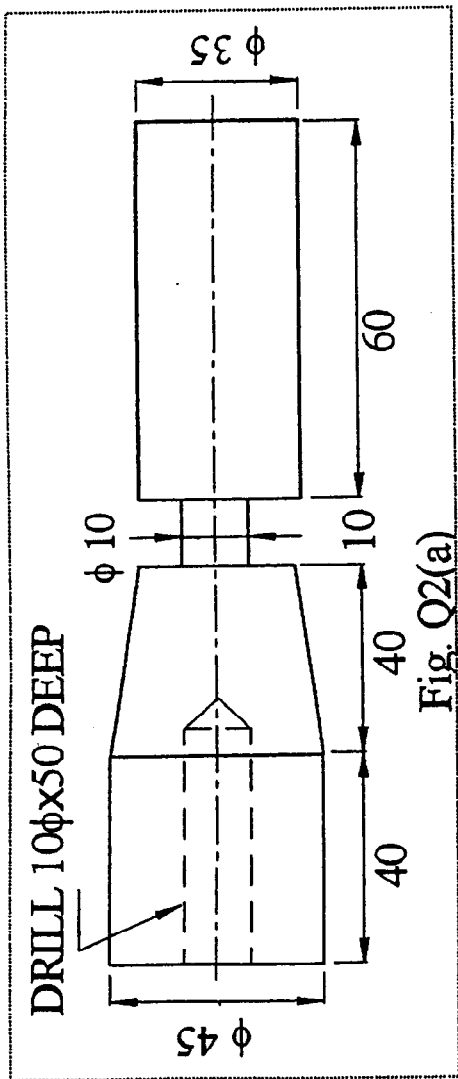


Fig. Q2(a)

Figure 2 Figure for question 5

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TAUC112 – WORKSHOP PRACTICE

TEST -1

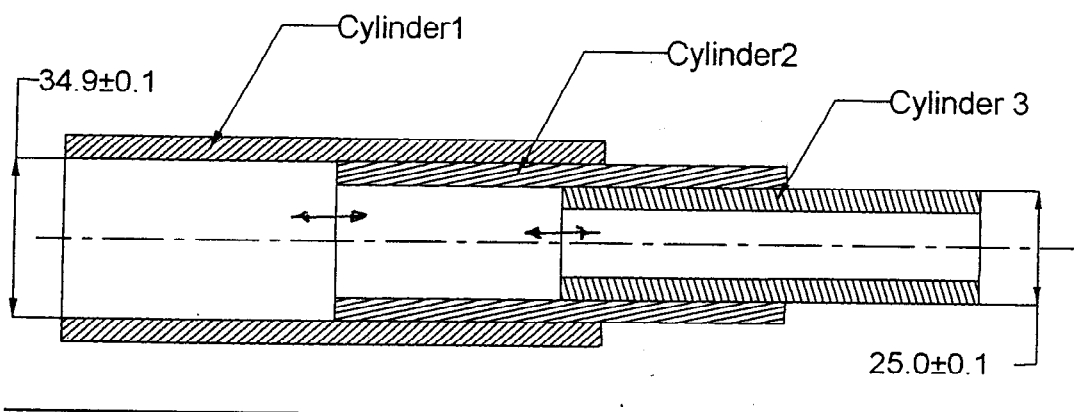
Date	30 th October 2006	Duration	50minutes
Weight	25	Component type	Open Book

Instructions

1. Answer in brief.
2. Draw neat sketches if required.
3. All questions carries equal marks

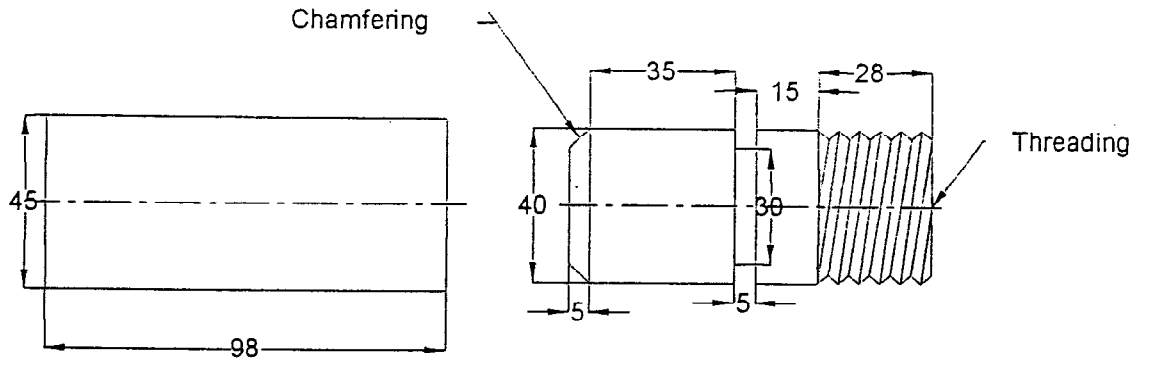
Question

1. The Japanese philosophy of manufacturing "JIT – Just in Time Manufacturing" ensures zero defects in the system. One way of achieving this by using the concept of "POKA – YOKE – fool proofing design". In cellular phones, this concept is used in designing the SIM cards. In brief discuss how is POKA – YOKE used in SIM card design.
2. In a telescopic antenna design, three cylinders are placed as shown in figure. If Cylinder 3 has to slide into Cylinder 2 and similarly Cylinder 3 has to slide into Cylinder1, what is the type of fit you would recommend for the assembly and determine the dimensions of Cylinder 2?



3. "Components made out of Cast Iron are machined without coolant"– State true or false with reason.
4. Irrespective of various manufacturing processes like casting, forming, welding etc, used in production, machining process is required to finish the component. Comment on this statement.
5. A component is to be turned from the given cylindrical bar as shown in the figure. List the possible sequence of operation.

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B

**BITS, PILANI-DUBAI CAMPUS, KNOWLEDGE VILLAGE, DUBAI
FIRST SEMESTER 2006-2007
TA UC112 WORKSHOP PRACTICE**

QUIZ

DATE: 12-10-06

DURATION: 30 MINUTES MAXIMUM MARKS: 20

Note :

- 1) Answer only in the sheet provided
- 2) Put X across the correct answer. Do not scribe or overwrite
- 3) Write version of your Question paper, Name, I D No. & Section number on the answer
- 4) Return the answer sheet

VERSION B

1. Machine bed are not fabricated (Welded) using Low Carbon steel because
 - a) It has poor vibration damping properties
 - b) It has poor machinability properties
 - c) It is cheap and easily available
 - d) All of the above
2. The wings of an industrial pedestrian fan are covered with a weld mesh to
 - a) Avoid accidents due to moving parts.
 - b) Act as a filter and collect dust and thus avoid accident due to air pollution.
 - c) To improve the aesthetics of the product.
 - d) Avoid rusting of the chain.
- 3 Out of all the mechanical properties of an engineering material -----is a tensile property.
 - a. Malleability b. Ductility c. Brittleness d. All of the above
- 4 Process yield is a function material usage. Among the following process which has high yield
 - a. Machining b. Forming c. Casting d. All above
- 5 Manufacturing process involving granulate and particle sized material is -----
 - a. Machining b. Forming c. Powder Metallurgy d. All above
6. Among the following which the best suited production method for air craft
 - a) Mass production
 - b) Job shop production
 - c) Batch shop production
 - d) Flexible manufacturing process