BITS-Pilani, Dubai
Knowledge Village
Dubai

TAUC112 – Workshop Practice
Final Comprehensive Examination

Date	20th May 2007	**Duration**	3 hours
Marks	75	**Component type**	Closed book

Instructions

1. Answer PART A and PART B in separate answer sheets.
2. Question 1 in PART-A & PART- B is to be answered in brief.
3. Answer in Brief and sequentially.
4. Provide neat sketches.

PART A

1 A Among the various strengths namely ultimate strength, breaking strength and yield strength which is considered for design and why? (2)

B What is nitriding? How is it different from carburizing ? (2)

C What is meant by casting yield, how is it calculated (2)

D As an entrepreneur, you need to buy a lathe among the following specifications, identify the most important specifications to buying a lathe. give reasons. (2)

Packing details –(length, breath , height) of the lathe

Power consumed by the main motor

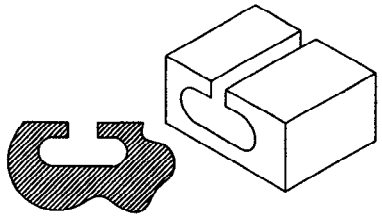
Distance between centers

Speed of the spindle,

E What is the need for a clapper box arrangement in a shaper? (2)

F The slip gauges used in the workshop metrology department is finished using _____ process. (2)

L A machinist is required to cut a slot (as shown in figure) in the using a milling machine. Suggest which type of milling machine and the tools used (2)



PART –A -2

2 With example show how the casting is significantly different in shape from that of the pattern used to make the mould (7.5)

3 The component shown in figure (fig no.1) is to be machined from a cylindrical rod of size 50mm and length 200mm. (8.5)

4 Write short notes on (7.5)

A Tool life

B Fatigue and creep stress

C Different types of taper turning methods

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PART B

1 A Define embossing operation. (2)

B Define break even point. How is it significant is financial accounting (2)

C Differentiate between open and closed loop control systems using a figure. (2)

D What is meant by EOQ? (2)

E The following are the processing times required to process five jobs $(j_1, j_2, j_3, j_4, j_5)$ - (12, 13, 6, 8, &10 minutes). While the customer waiting times are (11, 15, 8, 8, &15 minutes) what will be the sequence if SPT, rule is followed to sequence the activities. (2)

F List three different applications of robots in manufacturing. (2)

G "Open loop systems are more reliable than closed loop systems" – comment on this statement. (2)

PART- B- 2

2 A company has an order for 1,90,000 units for a particular component. There are two alternative methods to manufacture the product. The cost details of the two methods are as follows: (7.5)

Costs	Method 1	Method 2
Building	Rs.30,00,000	Rs.40,00,000
Machinery	Rs.30,00,000	Rs.40,00,000
Fixed production overheads	Rs.2,00,000	Rs.1,00,000
Variable production cost/unit	Rs.40	Rs.30
Selling Price	Rs.180	Rs.180

1. Select the best method for manufacturing the component
2. What would be the loss if a wrong choice were made?
3. If the organization sells 2,25,000 units. What is the loss or gain?

3 A firm gets an order to manufacturing measuring jars to be supplied to the PDS (Public distribution System) centers. The sketch of the measuring jars is shown in figure 2. The jars are to be fabricated using sheet metal of size 8' X 4'. Draw the layout of the sheet and the list the various sheet operations performed. (8.5)

3 Write short notes on (7.5)

A Inventory control – blessing in disguise

B Robots in manufacturing

C Scheduling methods practiced in manufacturing

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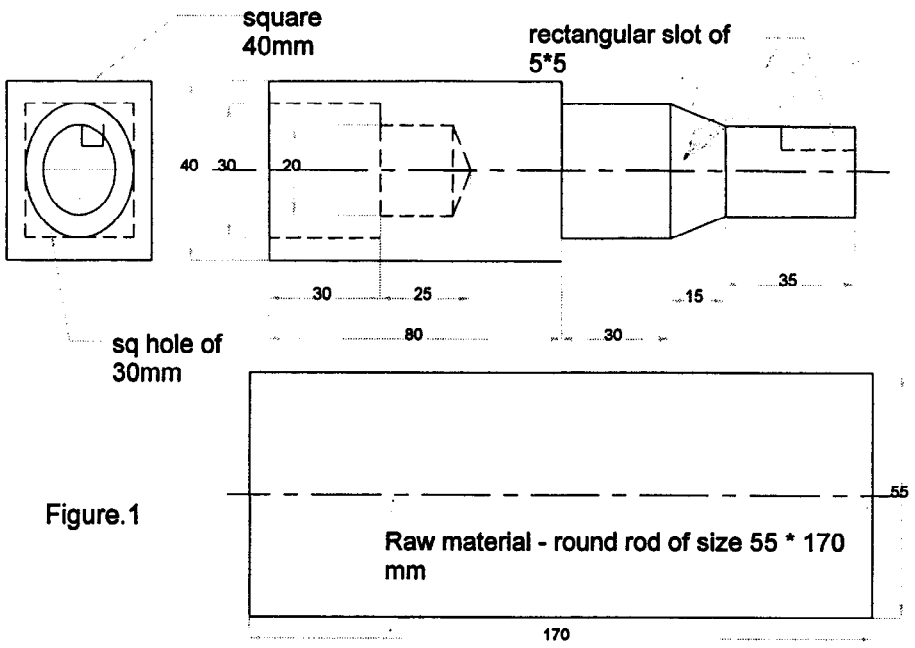

Figure.1

Figure : 2 Measuring Jar

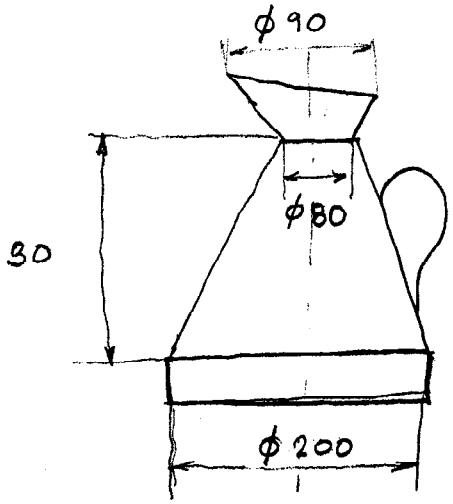

Figure not to scale

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TAUC112 – Workshop Practice
Test – 2

Date	6th May 2007	Duration	50minutes
Marks	30	Component type	Closed book

Instructions

1. Answer in Brief and sequentially.
2. Provide neat sketches.

1 The "L" Bracket shown in the figure is produced by using Cast Iron in green sand moulding process. The following are the dimensions of the bracket : length of the bracket 150mm, thickness 5mm, width and height 25mm. Comment on the following

- A The type of pattern used. Give reasons 1
- B Comment on the pattern material if more than 1000 parts are required 1
- C Among the two different position of the pattern (shown in figure), which is the correct design? Validate your answers 2
- D Determine the dimensions of the pattern if a shrinkage allowance of 3%, draft of 1° on all vertical sides and machining allowance for a skin machining of 2mm on the other side (where there is no stiffener) has to be provided 3

2 What is the function of the riser in the moulding process 2

3 When is core used in the moulding process 1

4 A company ABC manufacturers AC duct made out of GI sheets for centralized air conditioning systems. Suggest the possible sheet metal layout and the allied operations to produce the AC diffuser shown in the figure 3

5 Differentiate between Punching and Blanking process with example 2

6 Differentiate between Soldering and Brazing process 2

7 List characteristics of the different types of flames possible in gas welding 3

8 Differentiate between annealing and tempering process 2

9 Discuss the need for newer machining process with three different cases 3

10 List any two major factor which affects the selection of the grinding wheel 2

11 Differentiate between Drawing and Spinning process 2

12 What is meant by Carburizing 1

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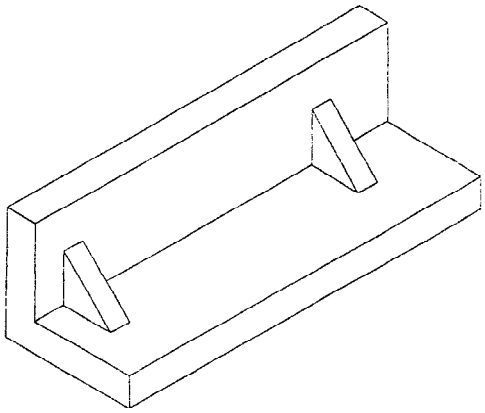
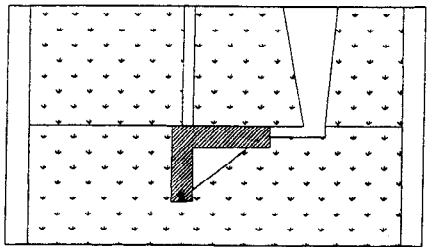
L Bracket for casting



Type A



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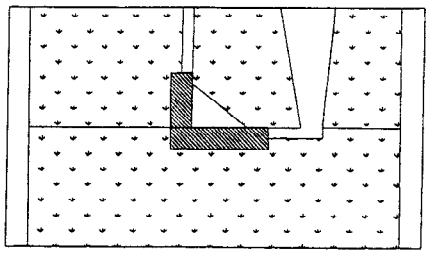

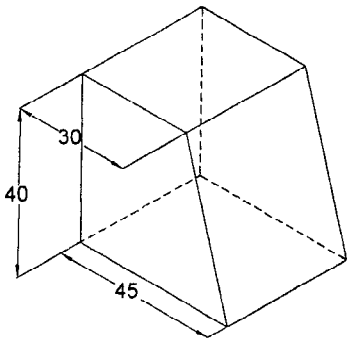

AC duct

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TAUC112 – Workshop Practice
Quiz -1 - VERSION A

Duration 30 minutes **Maximum marks** 20

Instructions

1. Write version, name, ID, section on the answer script clearly
2. Mark "**X**" for the correct answer in the answer script
3. Do not over write or mark more than one choice in the answer script
4. **Negative marking of 0.5 marks for each wrong answer.**

1. The characteristics of Mass production are : A. *Very high volume of output. B. Very high investment cost. C. Very high product variety in the system. D. Quick change over from one product to another product.*

1. All above statement are correct. **2. Only statement "A" is correct**
3. Statement " A" and " B" are only correct **4.Statement "A" and "C" are only correct.**

2. Material wastage is very high in case of

1. Metal casting. 2. Metal forming. 3. Metal machining. 4.Metal Joining Process.

3. You do not use helmets in workshop because

1. it bring in lot of sweat to the students **2.There are no head injuries in workshop**
3. Students do not look smart. **4. Students are not subjected to heavy engineering works.**

4. Steel bar is heated and cooled regularly. One fine day it fails (gets cut), this is because of _____ loading pattern.

1. Tensile stress. 2. Fatigue stress. 3. Creep stress. 4. All above.

5. During machining operation, the material chips off

1.Along the shear plane **2.along the plane perpendicular to the shear plane**
3.Any arbitrary plane. **4.A plane parallel to the surface of work piece at the point of contact.**

6. For a specific application, material which holds the following properties is required: *High electrical conductance, Good machinability, Easy formability, Poor weld ability and Low weight & high strength.* Among the following materials which is most preferred

1. Gold **2. Silver** **3.Aluminum.** **4.Plastics.**

7. To improve the wear resistance of HSS, _____ is the alloying element

1.Tungsten **2.Molybdenum** **3.Vanadium** **4.Cobalt.**

8. It is generally preferred to have a _____ to improve the tool life.

1.Positive rake angle **2.Zero rake angle** **3.Negative rake angle** **4.None of these**

9. The time between two sharpening of a HSS is _____ if the cutting speed is 80 $m.\min^{-1}$ if the exponential index is 0.09. it was also found that the time between two sharpening was 50 min for a cutting speed of 100 $m.\min^{-1}$.

1). 786 min **2).108min** **3).596 min** **4).625 min**

10. The type of fit obtained for an hole size of $29^{\pm 0.013}$ and shaft size of $29^{\pm 0.013}$ is

1. Clearance fit 2.interference fit 3. Transition fit 4.No comment

11. Find the odd member among the following

1.HSS 2. Cast Iron 3.Carbide 4.Diamond

12. Find the odd member among the following

1. Yield stress 2.Ultimate stress 3. Elasticity 4.Poisson's ratio

13. Among the following which is not characteristic of Grey Cast Iron

1. High Vibration damping properties 2.High Tensile stress
3. Highly brittle 4.Poor machinability

14. Presence of which alloying element is not a good for steel

1.Chromium 2.Manganese 3.Phosphorus 4. Silicon

15. The lead screw in the lathe is used to

1. Support the carriage. 2. Power the carriage 3.different function 4. Drive the dead center.

16. Among the following which type of chip produces a better surface finish

1.BUE (built up edges) 2.Discontinuous chips
3.Continuous chips 4.Chip type has no influence on the surface finish.

17. Which of the following is true with respect to the tailstock: **A**. It is used to hold the work piece between centers; **B**. It is not power in a center lathe. **C**. It cannot be useful in machining operation. **D**. It is used only to hold a revolving center.

1.Statement C & D are only true 2.Statement C & A are only true
3.Statement D & B are only true. 4.Statement A & B are only true.

18. Hot hardness is a property of a material to

1. Retain its brittleness at elevated temperature 2.Improve the hardness at elevated temperatures
3. Retain hardness at elevated temperatures 4. All above.

19. Find the odd member out

1.Three jaw chuck 2.Face plate 3.Collets chuck 4.Cross slide.

20. Among the following which parameter is not used to specify a lathe

1.Distance between centers 2.Distance between the bed to the spindle
3.The cutting tools used 4.Swing over the bed.