BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-A

Registration No.: .....

School of Manufacturing skill

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1101 **Time: 2 Hours**

Course Name: Assembly & Measuring **Max. Marks: 50**

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Which measuring instruments can be used to measure internal diameter of 20.015 mm?
   (a) Digital Vernier calipers
   (b) Micrometer.
   (c) Hole test Micrometer
   (d) Plug gauge
2. Which one of the example of form gauge?
   (a) Feeler gauge
   (b) Micrometer
   (c) Vernier Depth gauge
   (d) None of these
3. Which one of the following is not a part of a micrometer?
   (a) Thimble
   (b) spindle
   (c) probe
   (d) Anvil
4. For Which applications plunger dial indicators are not used?
   (a) Inspecting surface for flatness.
   (b) Aligning Work piece
   (c) Inspecting shaft roundness
   (d) Measuring boring diameter
5. Sensory inspection is a type of-
   (a) Subjective measurement
   (b) Objective measurement
   (c) A & B Both
   (d) None of the above

6. Outside Taper can be checked by-
   (a) Taper Plug Gauge
   (b) Outside Micrometer
   (c) Ring Gauge
   (d) Taper Ring Gauge
7. "Stem and stylus must be at right angle to the measurement surface." This sentence suit for
   (a) Puppet dial test indicator
   (b) Plunger Type Test Indicator
   (c) Sine Bar
   (d) None of the above
8. Standard Temperature for measurement is
   (a) 25^0 C
   (b) 20^0 C
   (c) 18^0 C
   (d) None of the above
9. Least size available in Slip Gauge block set which you have used: -
   (a) 1.0005
   (b) 1.05
   (c) 1.050
   (d) 1.005
10. Radius gauge is type of.
   a) Form gauge.
   b) Limit gauge.
   c) Dimensional gauge
   d) Both form and limit gauge.

Section – B

04X04 = 16 Marks

11. Explain the Bevel protractor with its parts name.
12. Write any 4 Safety precautions while using slip gauge.
13. Write the difference between measuring instruments and gauges.
14. Which factors should we consider to select measuring tool?

Section – C

04X06 = 24 Marks

15. Importance of Least count and Calculate the least count of micrometer which has 50 divisions on secondary scale.
16. Explain different types of errors in measurement.
17. Explain any Three.
   (a) Calibration of Measuring Instruments
   (b) Surface table
   (c) Digital Vernier calipers
   (d) Dial caliper
18. (A) Calculate the least count of Vernier caliper which has 50 divisions on secondary scale with write down the formula.
   (B). Write down the different parts of micrometer with their application.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-A

Registration No.: .....

School of Manufacturing skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1101 **Time: 2 Hours**

Course Name: Assembly & Measuring **Max. Marks: 50**

Answer Key

Section – A

10X01 = 10 Marks

1. Which measuring instruments can be used to measure internal diameter of 20.015 mm?
   d) Hole test Micrometer
2. Which one of the example of form gauge?
   a) Feeler gauge
3. Which one of the following is not a part of a micrometer?
   c) probe
4. For Which applications plunger dial indicators are not used?
   d) Measuring boring diameter
5. Sensory inspection is a type of?
   a) Subjective Measurement
6. Outside Taper can be checked by
   d) Taper Ring Gauge
7. "Stem and stylus must be at right angle to the measurement surface." This sentence suit for
   a) Plunger Type Test Indicator
8. Standard Temperature for measurement is
   b) 20 C
9. Least size available in Slip Gauge block set which you have used:
   d) 1.005
10. Radius gauge is type of.
    a) Form gauge.

Section – B

04X04 = 16 Marks

11. Explain the Bevel protractor with its parts name.

    Ans. It is used to measure the angle of mechanical parts

    PARTS
    1. Main scale
    2. Solid beam
    3. Adjustable measurement beam
    4. Clamp screw
    5. Secondary scale
12. Write any 4 Safety precautions while using slip gauge?

    Ans. 1. It should not be fallen down, even not on the soft floor.
    2. Clean the measuring surface before measuring.
    3. After use apply Vaseline on measuring surface.
    4. Take out only blocks which is to be used.

13. Write the difference between measuring instruments and gauges.

S.No.	Gauges	Measuring instruments
1.	Gauge are used to check the work piece	Instruments are used to measure the work piece
2.	This is used for mass production mainly	Instruments are used for bought out inspection
3.	Gauges have fix dimension or fix Value	Instruments have variable dimension or value

14. Which factors should we consider to select measuring tool?

Ans:- 1. Tolerances of given size
2. Range of given dimension
3 Availability of measuring instruments
4. Time consumption in measurements

Section – C

04X06 = 24 Marks

15. Importance of Least count and Calculate the least count of micrometer has 50 divisions on secondary scale.

Answer: - <u>Importance of least count: -</u>

I. Without least count we cannot take Measurement.
II. To define any kind of reading in measuring instruments we should know the least count.
III. With the help of least count of measuring instruments we can define the precision.

Least count of micrometer = value of one division on main scale/ Total No of division on sub scale

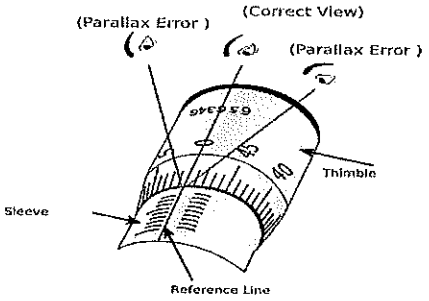
= .50/50

=0.01 mm.

16. Explain different types of errors in measurement.

Types of Error

1. Parallax Error –Parallax error is the shift in apparent position of an object due to different viewing position. When we have to take reading from an instrument or do some measurements then different viewing position will give different readings leading to an error. This could be removed by keeping our eyes in front of the thing to be viewed.



2. Tilt Error - This error occurs due to having play between slider and beam. When we applied excessive force on slider to clamp the workpiece then slider may displace from it's original position this lead to error in measuring instruments. To avoid this error, we should apply limited force on jaws.
3. Cocking Error- when we measure the distance between reference face and measuring face of the work piece or measuring instruments then the reference faces and measuring faces of work piece and measuring instrument should be parallel if it is not then it will show wrong value.
4. Dirt or Burrs Error –it is caused by dirt and burr on the work piece and measuring instruments

17. Explain any Three.

Answer: -

(1) Calibration of measuring Instruments: -

Calibration means to check the correctness of measuring instruments with a standard.

It is very important otherwise we cannot sure the about perfect measurement.

With the help of Slip gauge grade 00 we can check or calibrate the measuring instruments.

(2) Surface plate in measuring

Surface plate is a standard base plate used for measuring. This is very precise and accurate & provide the flat datum to measure any kind of dimension.

It can be made of Cast Iron and Granite.

Granite Surface table is very precise and costly.

It is having a very good compressive strength.

(3) Digital vernier caliper

with the calipers type, the measurement value read from a digital display. This makes reading errors almost impossible.

(4) Dial caliper

Dial caliper is measuring instruments to check the various dimension like length, width, thickness, depth etc
It is having a least count of 0.01 mm.
Dial caliper is an advance Vernier with having dial.
With the help of dial caliper we can identify the measurement variation also.

18. (A) Calculate the least count of Vernier caliper which has 50 divisions on secondary scale with write down the formula.

(B). Write down the different parts of micrometer with their application.

Calculate the least count of Vernier caliper which has 50 divisions on secondary scale with write down the formula.

Ans:- **Formula:**

L.C = One values of smallest division on main scale / Total division on secondary scale

OR

L.C = Main scale division – Vernier scale division

Calculate least count:

L.C = 1 / 50 = 0.02mm

Or

L.C = 1 – 0.98 = 0.02mm

(B) Write down the different parts of micrometer with their application.

Answer.

- **Ratchet-** used to apply constant and limited measuring force and also used for fine movement.
- **Thermal insulation pad-** does not allow transferring the body heat to micrometer.
- **Anvil and spindle-** Anvil used to support the work piece and create reference face and spindle create measuring face, it consist linear and rotational motion.
- **Measuring scale-** works on the pitch principle or can be defined as one rotation of circular scale gives one division linear movement on main scale.
- **Frame** – it is required for providing support to all components of micrometer.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-B

Registration No.: .....

School of Manufacturing skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1101 **Time: 2 Hours**

Course Name: Assembly & Measuring **Max. Marks: 50**

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Material of a measuring tool should be.?
   (a) Softer than the work piece.
   (b) Harder than the work piece.
   (c) Same hardness as of work piece
   (d) None of the above.
2. For Which applications plunger dial indicators are not used?
   (a) Inspecting surface for flatness.
   (b) Aligning work piece
   (c) Inspecting shaft roundness
   (d) Measuring boring diameter
3. Which one of the following is not a part of a micrometer?
   (a) Thimble
   (b) spindle
   (c) probe
   (d) Anvil
4. Which one of the example of form gauge?
   (a) Feeler gauge
   (b) Micrometer
   (c) Vernier Depth gauge
   (d) None of these
5. Sensory inspection is a type of.
   (a) Subjective measurement
   (b) Objective measurement
   (c) A & B Both
   (d) None of the above

6. Outside Taper can be checked by
   (a) Taper Plug Gauge
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   (c) Ring Gauge
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7. "Stem and stylus must be at right angle to the measurement surface." This sentence suit for
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   (d) None of the above
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   (a) 25^0 C
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9. Least size available in Slip Gauge block set which you have used: -
   (a) 1.0005
   (b) 1.05
   (c) 1.050
   (d) 1.005
10. Radius gauge is type of.
   a) Form gauge.
   b) Limit gauge.
   c) Dimensional gauge
   d) Both form and limit gauge.

Section – B

04X04 = 16 Marks

11. Explain the Bevel protractor with its parts name?
12. Explain the Depth vernier with its parts name?
13. Write the difference between measuring instruments and gauges?
14. Write any 4 Safety precautions while using slip gauge.

Section – C

04X06 = 24 Marks

15. Importance of Least count and Calculate the least count of micrometer which has 50 divisions on secondary scale.
16. Explain different types of errors in measurement.
17. Explain any Three.
   (a) Calibration of Measuring Instruments
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18. (A) Calculate the least count of Vernier caliper which has 50 divisions on secondary scale with write down the formula.
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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-B

Registration No.: .....

School of Manufacturing skill

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1101 **Time: 2 Hours**

Course Name: Assembly & Measuring **Max. Marks: 50**

Answer Key

Section – A

10X01 = 10 Marks

1. Material of a measuring tool should be?
   d) Harder then the workpiece
2. For Which applications plunger dial indicators are not used?
   d) Measuring boring diameter
3. Which one of the following is not a part of a micrometer?
   c) probe
4. Which one of the example of form gauge?
   a) Feeler gauge
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10. Radius gauge is type of.
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Section – B

04X04 = 16 Marks

11. Explain the Bevel protractor with its parts name?

    It is used to measure the angle of mechanical parts

    PARTS

    1. Main scale
    2. Solid beam
    3. Adjustable measurement beam
    4. Clamp screw
    5. Secondary scale

12. Explain the Depth vernier with its parts name?

    Ans. A depth gauge is an instrument for measuring depth below a reference surface.

Parts name-

i. Beam
ii. Vernier scale
iii. Main scale
iv. Refrance surface
v. clamping screw
vi. Fine feed slider

13. Write the difference between measuring instruments and gauges?

S.No.	Gauges	Measuring instruments
1.	Gauge are used to check the work piece	Instruments are used to measure the work piece
2.	This is used for mass production mainly	Instruments are used for bought out inspection
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Ans:- 1. It should not be fallen down, even not on the soft floor.
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Section – C

04X06 = 24 Marks

15. Importance of Least count and Calculate the least count of micrometer which has 50 divisions on secondary scale.

1. Importance of Least count and Calculate the least count of micrometer has 50 divisions on secondary scale.

Answer: - <u>Importance of least count: -</u>

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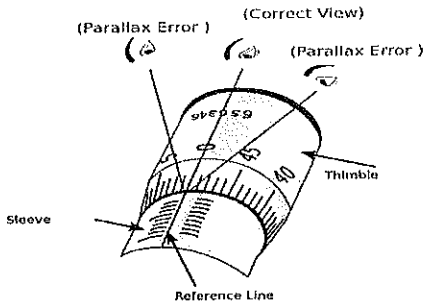

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   with the calipers type, the measurement value read from a digital display. This makes reading errors almost impossible.

4. **Dial caliper**

   Dial caliper is measuring instruments to check the various dimension like length, width, thickness, depth etc

It is having a least count of 0.01 mm.
Dial caliper is an advance Vernier with having dial.
With the help of dial caliper we can identify the measurement variation also.

18. A)

Calculate the least count of Vernier caliper which has 50 divisions on secondary scale with write down the formula.

Ans:- **Formula:**

L.C = One values of smallest division on main scale / Total division on secondary scale

OR

L.C = Main scale division – Vernier scale division

Calculate least count:

L.C = 1 / 50 = 0.02mm

Or

L.C = 1 – 0.98 = 0.02mm

(B) Write down the different parts of micrometer with their application.

Answer.

- **Ratchet-** used to apply constant and limited measuring force and also used for fine movement.
- **Thermal insulation pad-** does not allow transferring the body heat to micrometer.
- **Anvil and spindle-** Anvil used to support the work piece and create reference face and spindle create measuring face, it consist linear and rotational motion.
- **Measuring scale**- works on the pitch principle or can be defined as one rotation of circular scale gives one division linear movement on main scale.
- **Frame** – it is required for providing support to all components of micrometer.

BSDU

SET-A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing School

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1102 **Time: 2 Hours**

Course Name: Handskills **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Marks.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. The drill which has taper shank should be clamped in
   a) Sleeve
   b) Drill chuck
   c) Tap wrench
   d) Collect chuck
2. Process steps for reaming-
   a) Spot drill-drill-core drill-reaming
   b) Spot drill-drill-tapping-reaming
   c) Spot drill-CSK-drill-core drill-reaming
   d) Spot drill-drill-core drill-CSK-reaming
3. Counter boring can be done without pre drill
   a. True
   b. False
4. Which of the following tool is used to scribe the circle, radii and hole spacing?
   a) Marking T-rule
   b) Try Square
   c) Divider
   d) None of the above
5. Punching is a process of-
   a) Making conical depression on to the surface of work piece
   b) Transferring the dimension and contour onto the work piece surface
   c) Both a & b
   d) None of them
6. The size of the rake angle mainly influences-
   a) Work piece surface
   b) Friction between tool and work piece
   c) Chip formation and cutting force
   d) None of the above

7. Which of the following is not responsible for the penetration of cutting wedge into the workpiece?
   a) Relief angle
   b) Wedge angle
   c) Workpiece material
   d) Cutting force
8. What happens if the size of clearance angle / relief angle becomes very less?
   a) The friction will be more and the surface quality will be bad
   b) Chips will break very easily
   c) Tool will penetrate deeper
   d) None of the above
9. Which of the following indicates the enlarging scale?
   a) 5:1
   b) 3:3
   c) 1:4
   d) None of the above?
10. Point angle of a twist drill is-
   a) 45^0
   b) 115^0
   c) 118^o
   d) 90^o

Section – B

04X04 = 16 Marks

11. Write the formula for cutting speed. Also define its nomenclature with its units. If rpm is given 500 and tool diameter is 2 cm, then calculate cutting speed.
12. What do you understand by Bench vice? Write the names of its parts. (with diagram)
13. Explain the cutting tool geometry. Also highlight the negative and positive rake angle (with figures).
14. Derive the expression to calculate the chamfer value for making radius by using file with diagram.

Section – C

04X06 = 24 Marks

15. What occupational safety should be considered during the work in the workshop (any ten)?
16. a) Write the application of filing.
    b) Write the properties of the granite surface.
17. Describe the Rules and Techniques should be considered during the tapping (minimum 300 words).
18. Write short notes on following:
    a) Scribing b) Punching c) Reaming d) Counter Boring

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-A

Registration No.: .....

School of Manufacturing School

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1102 **Time: 2 Hours**

Course Name: Handskills **Max. Marks: 50**

Answer Key

Section – A

10X01 = 10 Marks

1. The drill which has taper shank should be clamped in
   a) **Sleeve**
   b) Drill chuck
   c) Tap wrench
   d) Collect chuck
2. Process steps for reaming-
   a) Spot drill-drill-core drill-reaming
   b) Spot drill-drill-tapping-reaming
   c) **Spot drill-CSK-drill-core drill-reaming**
   d) Spot drill-drill-core drill-CSK-reaming
3. Counter boring can be done without pre drill
   a. True
   b. **False**
4. Which of the following tool is used to scribe the circle, radii and hole spacing?
   a) Marking T-rule
   b) Try Square
   c) **Divider**
   d) None of the above
5. Punching is a process of
   a) **Making conical depression on to the surface of work piece**
   b) Transferring the dimension and contour onto the work piece surface
   c) Both a & b
   d) None of them
6. The size of the rake angle mainly influences-
   a) Work piece surface
   b) Friction between tool and work piece
   c) **Chip formation and cutting force**
   d) None of the above
7. Which of the following is not responsible for the penetration of cutting wedge into the workpiece?
   a) Wedge angle
   b) Workpiece material
   c) Cutting force
   d) **Relief angle**

8. What happens if the size of clearance angle / relief angle becomes very less?
   a) **The friction will be more and the surface quality will be bad**
   b) Chips will break very easily
   c) Tool will penetrate deeper
   d) None of the above
9. Which of the following indicates the enlarging scale?
   a) 3:3
   b) 1:4
   c) **5:1**
   d) None of the above?
10. Point angle of a twist drill is?
   a) 45^0
   b) **118^0**
   c) 120^o
   d) 90^o
   e) None of the above

Section – B

04X04 = 16 Marks

11. Write the formula for cutting speed. Also define its nomenclature with its units. If rpm is given 500 and tool diameter is 2 cm, then calculate cutting speed.

Answer:

Cutting speed is defined as the speed (usually in meter per minute) of a tool when it is cutting the workpiece.

Formula: $V_c = \frac{\pi DN}{1000} \quad \frac{m}{minute}$

Where D: tool dia

N: RPM

Vc: Cutting speed

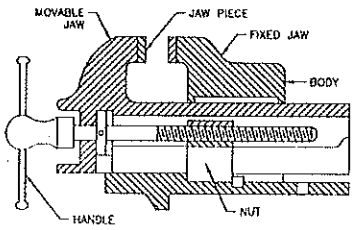
Put the values in the above expression we have

Vc= (3.14x20x500)/1000=31.4 m/min. (1cm=10 mm)

12. What do you understand by Bench vice? Write the names of its parts. (with diagram)

Answer:

It is the most commonly used vice sometimes also known as parallel jaw vice. It essentially consists of a cast steel body, a movable jaw, a fixed jaw, both made of cast steel, a handle, a square threaded screw and a nut all made of mild steel. A separate cast steel plates known as jaw plates with teeth are fixed to the jaws by means of set screws and they can be replaced when worn. The movement of the vice is caused by the screw which passes through the nut fixed under the movable jaw.

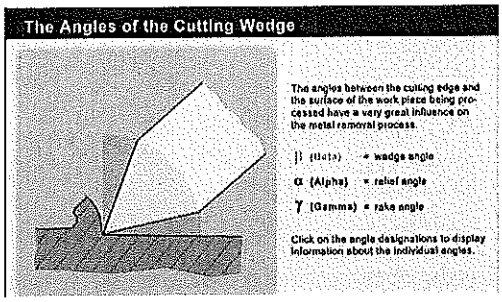


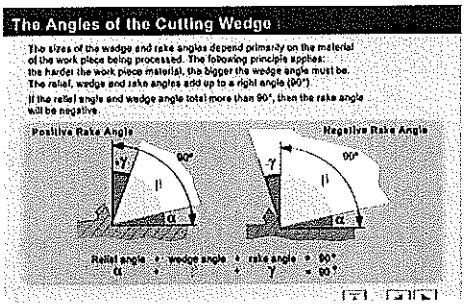
13. Explain the cutting tool geometry. Also highlight the negative and positive rake angle (with figures).

Answer:

There are three cutting angle of the cutting edge

1. Wedge angle
2. Rake angle
3. Relief angle.

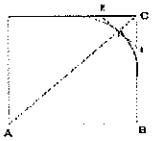




14. Derive the expression to calculate the chamfer value for making radius by using file with diagram.

Answer:

Derivation to Calculate Chamfer Value for Radius-



Let: AB = BC = AD = R

So in triangle ABC, angle C and A is of 45°

$AC^2 = AB^2 + BC^2 = R^2 + R^2 = 2R^2$

$AC = R\sqrt{2} = R \times 1.414 = 1.414R$

$AC = AD + CD \rightarrow CD = AC - AD \rightarrow CD = 1.414R - R = 0.414R$

In triangle FDC –

Angle D is of 90°, C is of 45°, so angle F is also of 45°

Then, $CF^2 = FD^2 + CD^2$

$\rightarrow (0.414R)^2 + (0.414R)^2$

$CF = 0.414R\sqrt{2} = 0.414R \times 1.414$

$CF = 0.5853R = CF \approx 0.6R$

Section – C

04X06 = 24 Marks

15. What occupational safety should be considered during the work in the workshop (any ten)?

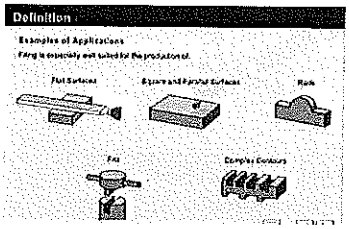
Answer:

- Clamp the workpiece firmly in the vise
- Prevent the saw from the slipping off by filing a notch
- Reduce the pressure before separating the workpiece
- Deburr the workpiece after sawing
- Check for a solid seating of the file handle
- Damaged file handle is to be replaced immediately
- Wear the safety shoes during the filling
- Use the safety glasses for the eye protection.
- Don't wear the jewelleries.
- Don't remove the chips with your finger, use the brush to remove chips.

- Deburr the workpiece on all sides.

16. a) Write the application of filing.

Answer:



b) Write the properties of the granite surface.

Answer:

Granite surface plates are best known due to their rustles properties. Granite surface plates remain unaffected by the change in temperature and Heat as well so hence it can maintain the flatness for a longer period of time. The hardness of the granite surface plates is more than the C.I Surface Plates.

17. Describe the Rules and Techniques should be considered during the tapping (minimum 300 words).

Answer:

- Select proper tap tool (ex. For blind tap-spiral flutes tap and throughout tap-straight flute tap)
- Workpiece clamping- The workpiece, as far as possible, should be clamped in such way, that they can be drilled, countersunk and taped in succession without the clamping being loosened in between. As well as it must be tight clamp.
- Select the proper tap holder as per need
- Clamp the tap in the tap holder properly. Please be sure before clamping it in spindle
- Clamp the tool and holder in the machine spindle
- Calculate the rpm by using formula (VC=$\pi dn/1000$) and input one-third of it.
- Calculate the depth by using following formula and set the depth in the scale by touching tool on w/p surface (not on the hole)
- Press the tapping cycle button (right hand)
- Cross check the depth set by dry run.
- If there is blind tap, please check the drill depth. It must be deeper than the tap depth.
- After check all the things such as head lock, rpm, depth, w/p clamping and etc. start the tapping by taking the proper posture (One hand on handle and other on emergence button)
- Kindly perform the tapping operation in the presence of a trainer.

18. Write short notes on following:

a) Scribing b) Punching c) Reaming d) Counter Boring

Answer:

- Scribing: It is a process to transfer the drawing dimensions and contours onto the workpiece.
- Punching: It is process to make a conical depression onto the workpiece surface.
- Reaming: Reaming is the process of enlarging a hole with surface finishing and accuracy.
- Counter Boring: It is a process to enlarge a hole with a certain depth. It is used to compensate height of the head of the Counter bore head screw to fit at the level of surface.

SET-B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing School

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1102 **Time: 2 Hours**

Course Name: Handskills **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Marks.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Process steps for reaming-
   a) Spot drill-drill-core drill-reaming
   b) Spot drill-drill-tapping-reaming
   c) Spot drill-CSK-drill-core drill-reaming
   d) Spot drill-drill-core drill-CSK-reaming
2. Which of the following tool is used to scribe the circle, radii and hole spacing?
   a) Marking T-rule
   b) Try Square
   c) Divider
   d) None of the above
3. Punching is a process of-
   a) Making conical depression on to the surface of work piece
   b) Transferring the dimension and contour onto the work piece surface
   c) Both a & b
   d) None of them
4. The size of the rake angle mainly influences-
   a) Work piece surface
   b) Friction between tool and work piece
   c) Chip formation and cutting force
   d) None of the above
5. The drill which has taper shank should be clamped in
   a) Sleeve
   b) Drill chuck
   c) Tap wrench
   d) Collect chuck

6. Which of the following is not responsible for the penetration of cutting wedge into the workpiece?
   a) Relief angle
   b) Wedge angle
   c) Workpiece material
   d) Cutting force
7. What happens if the size of clearance angle / relief angle becomes very less?
   a) The friction will be more and the surface quality will be bad
   b) Chips will break very easily
   c) Tool will penetrate deeper
   d) None of the above
8. Which of the following indicates the enlarging scale?
   a) 5:1
   b) 3:3
   c) 1:4
   d) None of the above
9. Point angle of a twist drill is-
   a) 45^0
   b) 115^0
   c) 118^o
   d) 90^o
10. Counter boring can be done without pre drill
   a) True
   b) False

Section – B

04X04 = 16 Marks

11. What do you understand by Bench vice? Write the names of its parts. (with diagram)
12. Explain the cutting tool geometry. Also highlight the negative and positive rake angle (with figures).
13. Derive the expression to calculate the chamfer value for making radius by using file with diagram.
14. Write the formula for cutting speed. Also define its nomenclature with its units. If rpm is given 500 and tool diameter is 2 cm, then calculate cutting speed.

Section – C

04X06 = 24 Marks

15. a) Write the application of filing.
    b) Write the properties of the granite surface.
16. Describe the Rules and Techniques should be considered during the tapping (minimum 300 words).
17. Write short notes on following:
    a) Scribing b) Punching c) Reaming d) Counter Boring
18. What occupational safety should be considered during the work in the workshop (any ten)?

SET-B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing School

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1102 **Time: 2 Hours**

Course Name: Handskills **Max. Marks: 50**

Answer Key

Section – A

10X01 = 10 Marks

1. Process steps for reaming-
   a) Spot drill-drill-core drill-reaming
   b) Spot drill-drill-tapping-reaming
   c) Spot drill-CSK-drill-core drill-reaming
   d) Spot drill-drill-core drill-CSK-reaming
2. Which of the following tool is used to scribe the circle, radii and hole spacing?
   a) Marking T-rule
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   a) Making conical depression on to the surface of work piece
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   d) None of the above
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   a) **Sleeve**
   b) Drill chuck
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   b) Chips will break very easily
   c) Tool will penetrate deeper

d) None of the above

8. Which of the following indicates the enlarging scale?
   a) 5:1
   b) 3:3
   c) 1:4
   d) None of the above
9. Point angle of a twist drill is-
   a) 45^0
   b) 115^0
   c) 118°
   d) 90^o
10. Counter boring can be done without pre drill
    a) True
    b) False

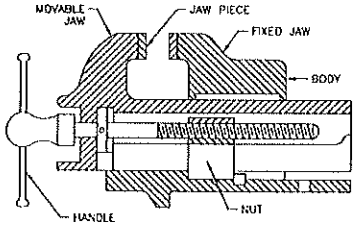
Section – B

04X04 = 16 Marks

11. What do you understand by Bench vice? Write the names of its parts. (with diagram)

Answer:

It is the most commonly used vice sometimes also known as parallel jaw vice. It essentially consists of a cast steel body, a movable jaw, a fixed jaw, both made of cast steel, a handle, a square threaded screw and a nut all made of mild steel. A separate cast steel plates known as jaw plates with teeth are fixed to the jaws by means of set screws and they can be replaced when worn. The movement of the vice is caused by the screw which passes through the nut fixed under the movable jaw.

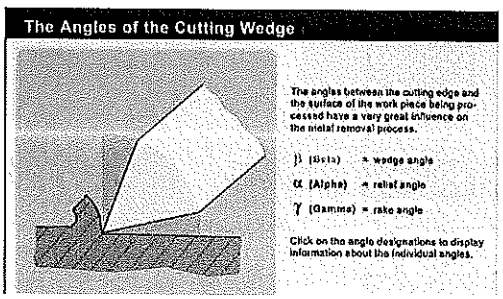


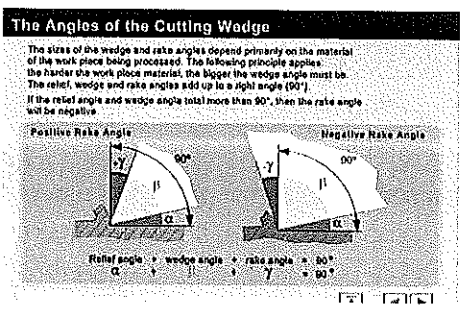
12. Explain the cutting tool geometry. Also highlight the negative and positive rake angle (with figures).

Answer:

There are three cutting angle of the cutting edge

1. Wedge angle
2. Rake angle
3. Relief angle.

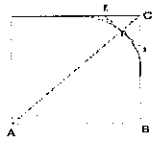




13. Derive the expression to calculate the chamfer value for making radius by using file with diagram.

Answer:

Derivation to Calculate Chamfer Value for Radius-



Let: AB = BC = AD = R
So in triangle ABC, angle C and A is of 45°
$AC^2 = AB^2 + BC^2 = R^2 + R^2 = 2R^2$
$AC = R\sqrt{2} = R \times 1.414 = 1.414R$
AC = AD + CD → CD = AC – AD → CD = 1.414R – R = 0.414R
In triangle FDC –
Angle D is of 90°, C is of 45°, so angle F is also of 45°
Then, $CF^2 = FD^2 + CD^2$
$\rightarrow (0.414R)^2 + (0.414R)^2$
$CF = 0.414R\sqrt{2} = 0.414R \times 1.414$
$CF = 0.5853R = CF \approx 0.6R$

14. Write the formula for cutting speed. Also define its nomenclature with its units. If rpm is given 500 and tool diameter is 2 cm, then calculate cutting speed.

Answer:

Cutting speed is defined as the speed (usually in meter per minute) of a tool when it is cutting the workpiece.

Formula: $V_c = \frac{\pi DN}{1000} \quad \frac{m}{minute}$

Where D: tool dia

N: RPM

Vc: Cutting speed

Put the values in the above expression we have

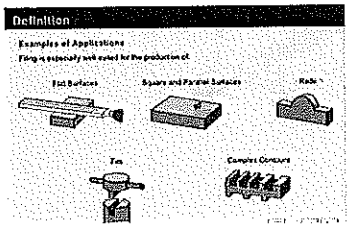
Vc= (3.14x20x500)/1000=31.4 m/min. (1cm=10 mm)

Section – C

04X06 = 24 Marks

15. a) Write the application of filing.

Answer:



b) Write the properties of the granite surface.

Answer:

Granite surface plates are best known due to their rustles properties. Granite surface plates remain unaffected by the change in temperature and Heat as well so hence it can maintain the flatness for a longer period of time. The hardness of the granite surface plates is more than the C.I Surface Plates.

16. Describe the Rules and Techniques should be considered during the tapping (minimum 300 words).

Answer:

- Select proper tap tool (ex. For blind tap-spiral flutes tap and throughout tap-straight flute tap)
- Workpiece clamping- The workpiece, as far as possible, should be clamped in such way, that they can be drilled, countersunk and taped in succession without the clamping being loosened in between. As well as it must be tight clamp.
- Select the proper tap holder as per need
- Clamp the tap in the tap holder properly. Please be sure before clamping it in spindle
- Clamp the tool and holder in the machine spindle
- Calculate the rpm by using formula (VC=$\pi dn/1000$) and input one-third of it.
- Calculate the depth by using following formula and set the depth in the scale by touching tool on w/p surface (not on the hole)
- Press the tapping cycle button (right hand)
- Cross check the depth set by dry run.
- If there is blind tap, please check the drill depth. It must be deeper than the tap depth.
- After check all the things such as head lock, rpm, depth, w/p clamping and etc. start the tapping by taking the proper posture (One hand on handle and other on emergence button)
- Kindly perform the tapping operation in the presence of a trainer.

17. Write short notes on following:

a) Scribing b) Punching c) Reaming d) Counter Boring

Answer:

- Scribing: It is a process to transfer the drawing dimensions and contours onto the workpiece.
- Punching: It is process to make a conical depression onto the workpiece surface.
- Reaming: Reaming is the process of enlarging a hole with surface finishing and accuracy.
- Counter Boring: It is a process to enlarge a hole with a certain depth. It is used to compensate height of the head of the Counter bore head screw to fit at the level of surface.

18. What occupational safety should be considered during the work in the workshop (any ten)?

Answer:

- Clamp the workpiece firmly in the vise
- Prevent the saw from the slipping off by filing a notch
- Reduce the pressure before separating the workpiece
- Deburr the workpiece after sawing
- Check for a solid seating of the file handle
- Damaged file handle is to be replaced immediately
- Wear the safety shoes during the filling
- Use the safety glasses for the eye protection.
- Don't wear the jewelleries.

Don't remove the chips with your finger, use the brush to remove chips.

SET-A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing skill

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1103 **Time: 2 Hour**

Course Name: Conventional Milling **Max. Marks: 50**

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. What is the Normal Clearance angle in Tool?
   a) 8 -10°
   b) 6-8°
   c) 4-6
   d) 5-7°
2. Wedge angle is the angle between _____ and _____.
   a) Tool flank & face
   b) Face & finish surface
   c) Perpendicular line to the point of contact & rake face
   d) None of these
3. What is the range for Vc on Mild Steel Work piece with hss tool?
   a) 100-400
   b) 50-100
   c) 25-30
   d) 50-75
4. Type 'H' milling cutters are used to cut _____ materials.
   a) Soft & stringy
   b) Hard & tough
   c) Hardened steel
   d) All of the above
5. Which type of wear is caused due to fluctuations in temperature?
   a) Edge fractures
   b) Thermal cracks
   c) Edge build -up
   d) Chips & splinters
6. Which tool holder is used for clamping Morse taper tool?
   a) Collet type tool holder
   b) Reducing bushes
   c) Weldon type tool holder

d) Arbor type tool holder

7. What is coolant concentration range for milling?
   a) 6-8%
   b) 12-15%
   c) 5-7%
   d) 18-20%
8. What is the another name of down milling?
   a) Climb milling
   b) Conv milling
   c) Up milling
   d) None of these
9. Which tool holder is use to clamp edge finder?
   a) Weldon type
   b) Collet type
   c) Weldon type
   d) Reducing bush type
10. Which tool is use to make chamfer on workpiece?
    a) Shoulder mill
    b) Face mill
    c) Slot drill
    d) End mill

Section – B

04X04 = 16 Marks

11. Write any 4 uses of Cutting Oil.
12. What is Milling? Differentiate between grinding and milling.
13. Write difference between turning and milling.
14. Write the uses of different types of milling tool holders.

Section – C

04X06 = 24 Marks

15. Explain any four type of Milling processes.
16. Describe the Steps to calculate R.P.M for ⌀50 Face mill with V_c= 450 and also calculate its Feed Rate with feed per tooth 0.15.
17. Explain the following: -
    a) Flank wear
    b) Crator wear.
18. Differentiate up milling and down milling with a suitable diagram?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-A

Registration No.: .....

School of Manufacturing skill

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1103 **Time: 2 Hour**

Course Name: Conventional Milling **Max. Marks: 50**

Answer Key

Section – A

10X01 = 10 Marks

1. What is the Normal Clearance angle in Tool?
   a) 8 -10°
   b) 6-8°
   c) 4-6
   d) 5-7°
2. Wedge angle is the angle between _____ and _____.
   a) Tool flank & face
   b) Face & finish surface
   c) Perpendicular line to the point of contact & rake face
   d) None of these
3. What is the range for Vc on Mild Steel Work piece with hss tool?
   a) 100-400
   b) 50-100
   c) 25-30
   d) 50-75
4. Type 'H' milling cutters are used to cut _____ materials.
   a) Soft & stringy
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   d) All of the above
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   a) 6-8%
   b) 12-15%

c) 5-7%

d) 18-20%

8. What is the another name of down milling?

a) Climb milling

b) Conv milling

c) Up milling

d) None of these

9. Which tool holder is use to clamp edge finder?

a) Weldon type

b) Collet type

c) Weldon type

d) Reducing bush type

10. Which tool is use to make chamfer on workpiece?

a) Shoulder mill

b) Face mill

c) Slot drill

d) End mill

Section – B

04X04 = 16 Marks

11. Write any 4 uses of Cutting Oil.

- Maintain temperature between tool and workpieces
- Better surface quality
- Increase tool life
- Better chips removal

12. What is Milling? Differentiate between grinding and milling.

Grinding- We use geometrically undefined cutting tool like grinding wheel

Milling- We use geometrically define cutting tool

13. Write difference between turning and milling.

Turning- We use single point cutting tool

Workpiece is rotating in chuck while tool is stationary

Milling- We use multipoint cutting tool

Workpiece is stationary in table while tool is rotating

14. Write the uses of different types of milling tool holders.

Arbor – This type tool holder is used to clamp tools which dont have shank

Weldon- This type of tool holder is used to clamp roughing tool

Collet- This type tool holder is used to clamp finishing tools

reducing bus- This type tool holder is used to clamp morse tapper tool

Section – C

04X06 = 24 Marks

15. Explain any four type of Milling processes.

Surface Milling- When material remove from workpiece surface called surface milling process

Circular Milling- When material remove in a circular profile

Profile milling- When we have to make a profile with same profile tools

Thread Milling- When we have to make thread on workpiece

16. Describe the Steps to calculate R.P.M for ⌀50 Face mill with V_c= 450 and also calculate its Feed Rate with feed per tooth 0.15.?

N = 1000 X 450 / 3.14 X 50

F= Fz X Z X N

17. Explain the following: -

a) Flank wear

b) Crator wear.

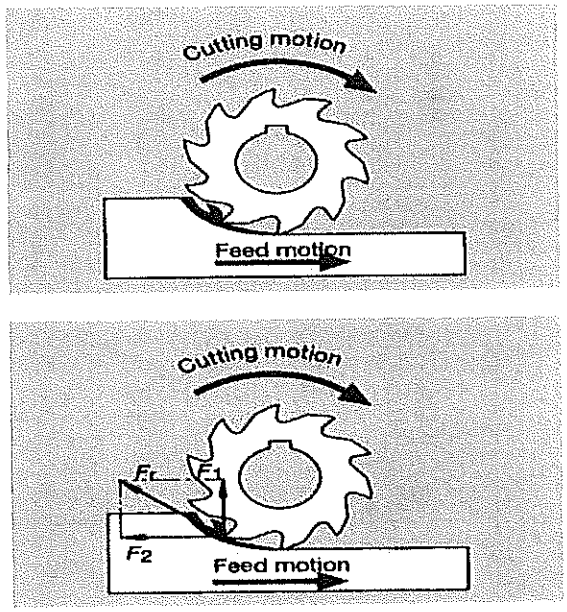
a) Flank wear

It causes due to friction between workpiece and tool When friction is high tool got damage

b) Crator wear.

It causes due to less carbon percentage in inserts. Due to less carbon percentage inserts are not hard

18. Differentiate up milling and down milling with a suitable diagram?



Conventional milling

In this process, the feed motion runs contrary to the cutting motion of the milling cutter. The cutting edges slide over the workpiece surface and cut into the material at the interface with high pressure. The resulting friction causes increased wear on the tool flanks. As the material is cut, a force (F_1) is exerted on the workpiece. Because the cutting force (F_2) works against the workpiece, a force (F_r) develops which attempts to loosen the workpiece from the clamping equipment. Faulty clamping may cause diminished surface quality and even force the workpiece out of the clamping equipment. Due to the opposing forces, some play in the feed device has a positive affect. Conventional milling can be performed on all milling machines.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-B

Registration No.: .....

School of Manufacturing skill

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1103 **Time: 2 Hour**

Course Name: Conventional Milling **Max. Marks: 50**

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. Which type of wear is caused due to fluctuations in temperature?
   a) Edge fractures
   b) Thermal cracks
   c) Edge build -up
   d) Chips & splinters
2. Which tool holder is used for clamping Morse taper shank tool?
   a) Collet type tool holder
   b) Reducing bushes
   c) Weldon type tool holder
   d) Arbor type tool holder
3. What is coolant concentration range for milling?
   a) 8-10%
   b) 12-15%
   c) 5-7%
   d) 18-20%
4. Rake angle is the angle which is useful for_____
   a) Cutting the work piece
   b) Coolant flow
   c) Chip removal
   d) Surface finish
5. What is another name for Climb Milling?
   a) Up milling
   b) Down milling
   c) Conventional milling
   d) All of the above
6. What is the range for Vc on mild steel work piece with carbide indexable tool?
   a) 25-30
   b) 400-500
   c) 80-100
   d) None of above

7. Which Cutting geometry of indexable insert is mainly selected for machining thin-walled workpiece?
   a) Axial rake angle negative and axial angle positive
   b) Axial rake angle positive and axial angle positive
   c) Axial rake angle positive and axial angle negative
   d) None of above
8. What is the main region behind built-up edges form on the cutting edge?
   a) Indexable inserts with insufficient strengths
   b) tool temperature is too high.
   c) At lower cutting speeds and with tough materials
   d) All of the above
9. Cutting Speed (vc) depends on:
   a) The workpiece material
   b) The tool material
   c) The required surface finish
   d) All of the above
10. Which tool holder is used for clamping Finish slot drill?
   a) Collet type tool holder
   b) Reducing bushes
   c) Weldon type tool holder
   d) Arbor type tool holder

Section B

04X04 = 16 Marks

11. Write any 4 uses of Cutting Oil.
12. What is Milling? Differentiate between grinding and milling.
13. Write down difference between turning and milling.
14. Write the uses of different types of milling tool holders.

Section C

04X06 = 24 Marks

15. Explain any four type of Milling processes.
16. Describe the Steps to calculate R.P.M for ?50 Face mill with Vc= 450 and also calculate its Feed Rate with feed per tooth 0.15.
17. Explain the following: -
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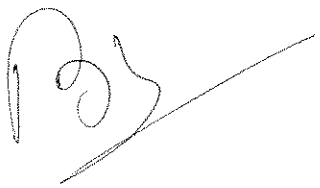

SET-B

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Manufacturing skill

Session: 2021-22 (Summer Semester)

B. Voc. Program, 1st Semester,

End-Sem. Examination

Course Code: SMS1103 **Time: 2 Hour**

Course Name: Conventional Milling **Max. Marks: 50**

Answer Key

Section – A

10X01 = 10 Marks

1. Which type of wear is caused due to fluctuations in temperature?
   a) Edge fractures
   b) Thermal cracks
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a) Indexable inserts with insufficient strengths

b) tool temperature is too high.

c) At lower cutting speeds and with tough materials

d) All of the above

9. Cutting Speed (vc) depends on:

a) The workpiece material

b) The tool material

c) The required surface finish

d) All of the above

10. Which tool holder is used for clamping Finish slot drill?

a) Collet type tool holder

b) Reducing bushes

c) Weldon type tool holder

d) Arbor type tool holder

Section B

04X04 = 16 Marks

11. Write any 4 uses of Cutting Oil.

Maintain temperature between tool and workpieces

Better surface quality

Increase tool life

Better chips removal

12. What is Milling? Differentiate between grinding and milling.

Grinding- We use geometrically undefined cutting tool like grinding wheel

Milling- We use geometrically define cutting tool

13. Write down difference between turning and milling.

Turning- We use single point cutting tool

Workpiece is rotating in chuck while tool is stationary

Milling- We use multipoint cutting tool

Workpiece is stationary in table while tool is rotating

14. Write the uses of different types of milling tool holders.

Arbor – This type tool holder is used to clamp tools which dont have shank

Weldon- This type of tool holder is used to clamp roughing tool

Collet- This type tool holder is used to clamp finishing tools

Reducing bus- This type tool holder is used to clamp morse tapper tool

Section C

04X06 = 24 Marks

15. Explain any four type of Milling processes.

Surface Milling- When material remove from workpiece surface called surface milling process

Circular Milling- When material remove in a circular profile

Profile milling- When we have to make a profile with same profile tools

Thread Milling- When we have to make thread on workpiece

16. Describe the Steps to calculate R.P.M for ?50 Face mill with Vc= 450 and also calculate its Feed Rate with feed per tooth 0.15.

    N = 1000 X 450 / 3.14 X 50

    F= Fz X Z X N

17. Explain the following: -

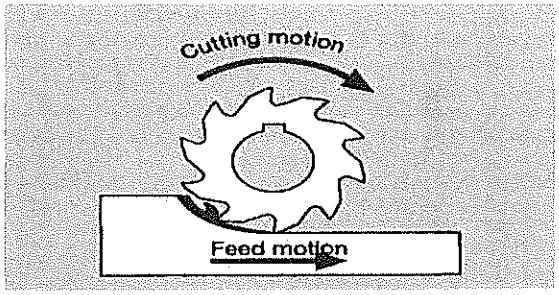
    a) Flank wear

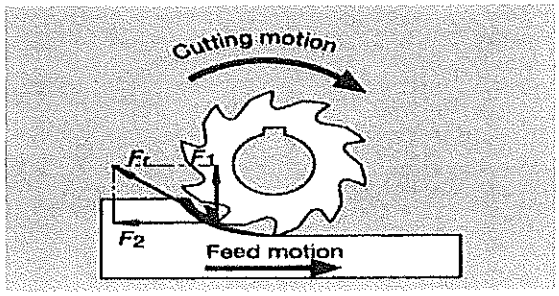
    It causes due to friction between workpiece and tool When friction is high tool got damage

    b) Crator wear.

    It causes due to less carbon percentage in inserts. Due to less carbon percentage inserts are not hard

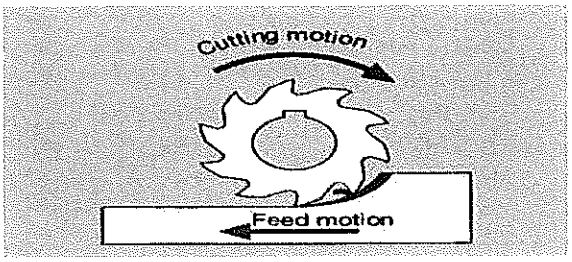
18. Differentiate up milling and down milling with a suitable diagram?

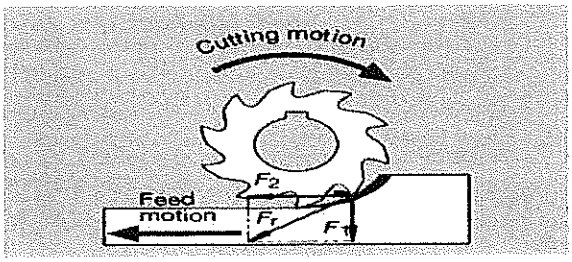




Conventional milling

In this process, the feed motion runs contrary to the cutting motion of the milling cutter. The cutting edges slide over the workpiece surface and cut into the material at the interface with high pressure. The resulting friction causes increased wear on the tool flanks. As the material is cut, a force (F_1) is exerted on the workpiece. Because the cutting force (F_2) works against the workpiece, a force (F_f) develops which attempts to loosen the workpiece from the clamping equipment. Faulty clamping may cause diminished surface quality and even force the workpiece out of the clamping equipment. Due to the opposing forces, some play in the feed device has a positive affect. Conventional milling can be performed on all milling machines.





Down milling

In this process, the workpiece feed motion operates in the same direction as the cutting motion of the milling cutter. The cutting edges cut abruptly into the surface of the workpiece and make the largest cut right at the beginning. As the material is cut, a force (F_1) is exerted on the workpiece. The cutting force (F_2) works in the direction of the feed motion. The resulting force (F_f) attempts to pull the workpiece under the milling cutter. In order to oppose this, the milling machine's feed drive must function backlash-free; it must be capable of controlling the forces that develop. Down milling enables larger cutting depths compared to conventional milling; therefore, it can only be performed on espe-cially stable milling machines.

SET-A

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.:.....

School of Manufacturing Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, I Semester,

End-Sem. Examination

Course Code: SMS1104 **Time: 2 Hour**

Course Name: Conventional Turning **Max. Marks: 50**

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. What is the use of rake angle in a tool?
   a) Chips removal
   b) Provide space between work piece and tool
   c) To give relief
   d) None of these
2. What does "D" represent in DCGT designation of indexable inserts?
   a) Wedge angle of 80 deg.
   b) Clearance angle 7 deg.
   c) Wedge angle of 55 deg.
   d) Wedge angle of 35 deg.
3. Which of the following is the correct formula for cutting speed?
   a) Vc = $\frac{\pi dn}{1000}$ cm/min
   b) Vc = $\frac{\pi dn}{1000}$ mm/min
   c) Vc = $\frac{\pi dn}{1000}$ m/min
   d) Vc = $\frac{\pi dn}{1000}$ km/min
4. Why we make undercut for making thread?
   a) Thread tool relaxation & Self-looking.
   b) To clean the face
   c) To reduce the diameter
   d) None of the above
5. Pitch is defined as
   a) The distance between two consecutive threads
   b) The distance between major diameter to minor diameter
   c) The distance between major diameter to Pitch circle diameter
   d) The diagonal Distance between flank face to root
   e)

6. What oxide ceramic consist of?
    a) Titanium nitride
    b) Pure aluminum oxide
    c) Silicon nitride
    d) None of the above
7. Which thread is capable to bear heavy load in both direction?
    a) V – shaped Threads
    b) Acme Threads
    c) Knuckle Threads
    d) Buttress Threads
8. When tear chips are formed?
    a) Using a large depth of cut, low cutting speed and a large rate of feed
    b) Using a low depth of cut, large cutting speed and a low rate of feed
    c) Using a low depth of cut, large cutting speed and a large rate of feed
    d) None of the above
9. DRO stands for-
    a) Diameter reading out
    b) Display read out
    c) Digital read out
    d) None of the above
10. Which type of chip has low accidental risk, easy chip disposal?
    a) Continuous chips
    b) Tear chips
    c) Shear chips
    d) None of the above

Section – B

04X04 = 16 Marks

11. Write difference between right hand tool and left hand tool? (with neat sketch)
12. If cutting velocity (Vc) is 30 m/min & workpiece diameter is 7cm. Calculate the rpm for facing of Aluminum workpiece
13. Define Upright lathe machine.
14. Define:
    - Tool wedge angle
    - Clearance angle
    - Rake angle

Section – C

04X06 = 24 Marks

15. What do you understand by Ceramics? Explain their types.
16. Write down the classification of thread.
17. Write the designation of the thread.
18. Calculate thread of M16X2.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-A

Answer sheet.....

School of Manufacturing Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, III Semester,

End-Sem. Examination

Course Code: SMS1304 **Time: 2 Hour**

Course Name: Pneumatics **Max. Marks: 50**

Answer Key

Section – A

04X04 = 16 Marks

1. Which type of valve we use in pneumatics?
   a) Slide
   b) Plane
   c) Poppet
   d) Spool
2. Standard atmospheric pressure is-
   a) 1.013 MPa
   b) 1.013 Pa
   c) 1.013 bar
   d) 1.013 N/m2
3. Which type of air dryer is used silica gel as a drying agent?
   a) Absorption air dryer
   b) Adsorption air dryer
   c) Refrigerant air dryer
   d) None of above
4. Which type of refrigerant used in refrigeration air dryer?
   a) R-22
   b) R-134a
   c) R-12
   d) All of above
5. Which of the following material is not used for pneumatic tubes?
   a) Nylon
   b) Aluminum
   c) Steel
   d) Polyurethane
6. The Fluid use to transmit power in Pneumatics is-
   a) Air
   b) Water
   c) Oil
   d) Liquid

7. In hydraulic system fluid is pressurized by:
   a) Air Compressor
   b) Electric motor
   c) Pump
   d) None of the above
8. Which compressor is used as portable compressor?
   a) Diaphragm compressor
   b) Single stage piston compressor
   c) Screw compressor
   d) Vane compressor
9. What is L in FRL unit-
   a) Lubricant
   b) Liquid
   c) Lubricator
   d) Lubrication
10. Which type of valves control the flow of fluid with the help of a disc or plug lifting and normally work against the gravity.
    a) Poppet valve
    b) Slide valve
    c) Monostable valve
    d) All of the above

Section – B

04X04 = 16 Marks

11. Define Pressure and Pascal Law.

- Pressure is defined as force per unit area. The standard unit for pressure is the Pascal, which is Newton per square meter.

$$P = F/A = N/ [\![mm]\!] \text{ ^2}$$

This unit is small and to avoid huge number, we use bar.

100,000 pa = 100KPa = 1bar

A pressure in the pneumatics is over-pressure (above the atmosphere pressure) and referred as gauge pressure.

A pressure below the atmosphere is under pressure or vacuum. The standard atm. Pr is 1.013 bar.Pascal law

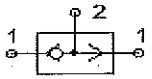
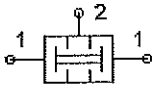
- An external pressure applied to a fluid in a closed vessel is uniformly transmitted throughout the fluid.

$$P1 = P2$$

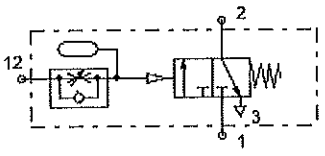
$$F1/A1 = F2/A2$$

12. Draw the symbol of OR and AND element and explain the difference between them. Also write their another name.

1.	OR element/shuttle valve		It provide output when we gives any input

			
2.	And element/dual pressure valve		It only provide output when we gives both side input

13. Write down any five applications of Pneumatics.
    - Operation of system valves for air, water or chemicals
    - Operation of doors
    - Unloading of hoppers in building, steel making, mining and chemical industries.
    - Lifting, Moving and Holding a part
    - Dental drills
14. Explain with the help of neat sketch the *Construction*, *Working* and *Function* of *Timer.*

12	Timer		It is a pneumatic device which used for provide delay in pneumatic input.

Section – C

04X06 = 24 Marks

15. Explain any five differences between Pneumatic System and Hydraulic System.

S. No.	Hydraulic System	Pneumatic System
1.	It uses a pressurized liquid as a fluid	It uses compressed gas, usually air, as a fluid
2.	An oil hydraulic system operates at pressure up to 700 bar	A pneumatic system usually operates at 10--12 bar
3.	Generally designed as closed system	Usually designed as open system
4	Valve operations are difficult	Valve operations are easy
5	Heavier in weight	Lighter in weight
6	Pumps are used to provide pressurized liquids	Compressors are used to provide compressed gases
7	The system has fire hazards	The system is free from fire hazards
8	Automatic lubrication is provided	Special arrangements for lubrication

16. Write down any five advantages of using atmospheric air in Pneumatics.
    - **Availability:** Air is available everywhere and can be compressed with a portable compressor so most factories and industries use this for many activities.
    - **Storage:** It is easily stored in tanks in large volume.
    - **Simplicity of Design:** Most pneumatic components are of simple design and structure.

- **Easy to Work:** Pneumatic components have simple control and are easily fitted to provide automation.
- **Choice of Movement:** It provides both linear movement and angular rotation with continuously variable operational speeds.
- **Economy:** Low installation cost and low maintenance cost as no service is required.

17. Explain the pressure regulator valve and draw its symbol also.

The purpose of a regulator is to keep the operating pressure as per application that may also known as secondary pressure that is constant regardless of fluctuations in either the line pressure (primary pressure) or air consumption.

The inlet pressure must always be higher than the outlet pressure. If there is too low air pressure then it reduces the efficiency and becomes uneconomical.

The pressure is regulated with the help of a diaphragm or piston to balance the outlet pressure against an adjustable spring force. The outlet pressure acts on one side of the diaphragm.

The spring force can be adjusted by an adjusting screw

18. Covert the following units:

a. 1 bar = _____ N/m2
b. 1 MPa = _____ bar
c. 1 atm = _____ bar
d. 1 bar = _____ PSI
e. 1 N/m2 = _____ Pa

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-B

Registration No.:.....

School of Manufacturing Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, I Semester,

End-Sem. Examination

Course Code: SMS1104 **Time: 2 Hour**

Course Name: Conventional Turning **Max. Marks: 50**

Instructions:

1. Attempt all questions.
2. Section A contains 10 Questions. Each question carries 1 Mark.
3. Section B contains 04 Questions. Each question carries 4 Marks.
4. Section C contains 04 Questions. Each question carries 6 Marks.

Section – A

10X01 = 10 Marks

1. What does "D" represent in DCGT designation of indexable inserts?
   a) Wedge angle of 80 deg.
   b) Clearance angle 7 deg.
   c) Wedge angle of 55 deg.
   d) Wedge angle of 35 deg.
2. What is the use of rake angle in a tool?
   a) Chips removal
   b) Provide space between work piece and tool
   c) To give relief
   d) None of these
3. Why we make undercut for making thread?
   a) Thread tool relaxation & Self-looking.
   b) To clean the face
   c) To reduce the diameter
   d) None of the above
4. Which of the following is the correct formula for cutting speed?
   a) $Vc = \frac{\pi dn}{1000}$ cm/min
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5. Pitch is defined as
   a) The distance between two consecutive threads
   b) The distance between major diameter to minor diameter
   c) The distance between major diameter to Pitch circle diameter
   d) The diagonal Distance between flank face to root

6. Which thread is capable to bear heavy load in both direction?
    a) V – shaped Threads
    b) Acme Threads
    c) Knuckle Threads
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7. What oxide ceramic consist of-
    a) Titanium nitride
    b) Pure aluminum oxide
    c) Silicon nitride
    d) None of the above
8. DRO stands for-
    a) Diameter reading out
    b) Display read out
    c) Digital read out
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9. When tear chips are formed
    a) Using a large depth of cut, low cutting speed and a large rate of feed
    b) Using a low depth of cut, large cutting speed and a low rate of feed
    c) Using a low depth of cut, large cutting speed and a large rate of feed
    d) None of the above
10. Which type of chip has low accidental risk, easy chip disposal
    a) Continuous chips
    b) Tear chips
    c) Shear chips
    d) None of the above

Section – B

04X04 = 16 Marks

11. Write difference between right hand tool and left hand tool. (with neat sketch)
12. Define
    - Tool wedge angle
    - Clearance angle
    - Rake angle
13. Define Upright lathe machine.
14. If cutting velocity (Vc) is 30 m/min & workpiece diameter is 7cm. Calculate the rpm for facing of Aluminum workpiece

Section – C

04X06 = 24 Marks

15. What do you understand by Ceramics? Explain their types.
16. Calculate thread of M16X2.
17. Write down the classification of thread?
18. Write the designation of the thread

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

SET-B

Registration No.:.....

School of Manufacturing Skills

Session: 2021-22 (Summer Semester)

B. Voc. Program, I Semester,

End-Sem. Examination

Course Code: SMS1104 **Time: 2 Hour**

Course Name: Conventional Turning **Max. Marks: 50**

Answer Key

Section – A

10X01 = 10 Marks

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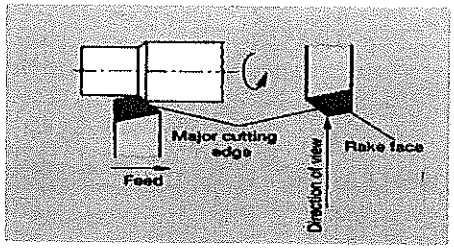
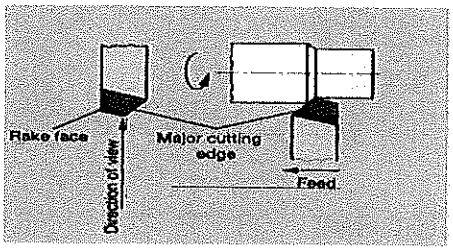
Section – B

04X04 = 16 Marks

11. . Write difference between right hand tool and left hand tool? (with neat sketch)





Left hand and right hand tools

Cutting tools are also characterised by the arrangement of their main cutting edge.

- **Left hand tool**
  When the direction of tool feed is from left to right then a left hand cutting tool must be used.
  When viewed from the workpiece the major cutting edge lies on the left side of the cutting tool.

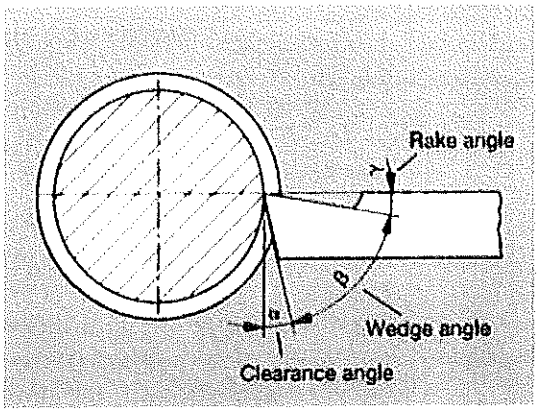
- **Right hand tool**
  With the right hand cutting tool the direction of feed is from right to left.
  Looking at the cutting head of the lathe tool the main cutting edge is on the right hand side.

12. Define.

    Tool wedge angle

    Clearance angle

    Rake angle



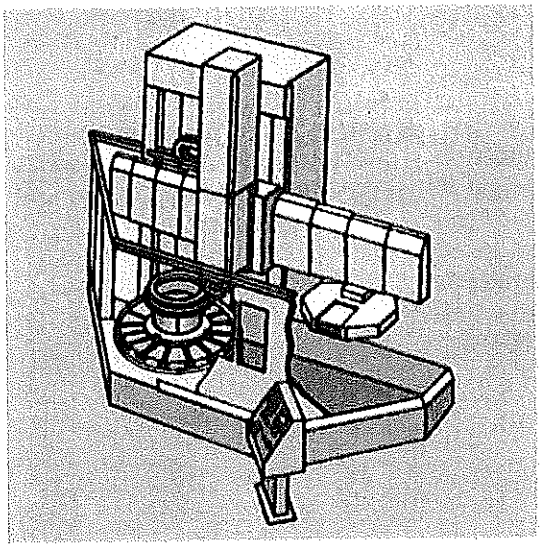
Tool wedge angle β (beta)
This is the angle between the rake face and the flank face. A larger wedge angle is required when the material being cut is of high strength. When cutting softer materials the wedge angle can be correspondingly smaller.

Clearance angle α (alpha)
This is the angle between the surface of the workpiece and the flank of the cutting wedge. Clearance angles of 6° to 8° are effective for metal working purposes.

Rake angle γ (gamma)
The rake angle has a major impact on chip formation. The rake angle lies between the horizontal line from the cutting surface and the rake face.

On lathe tools the rake angle, wedge angle and clearance angle always add up to 90°.

13. Define Upright lathe machine?



Upright (vertical) lathe

Upright lathes are used for machining heavy workpieces that cannot be set on other types of machine because of their weight. The turning axis of the upright lathe is vertical and the machine can accommodate workpieces up to 25 m in diameter.

14. If cutting velocity (Vc) is 30 m/min & workpiece diameter is 7cm. Calculate the rpm for facing of Aluminum workpiece

Ans. $VC = \frac{\pi dn}{1000}\ \mathrm{m/min}$

$= \frac{3.14X70Xn}{1000}\ \mathrm{m/min}$

= 135 rpm

= 270 RPM Approx.

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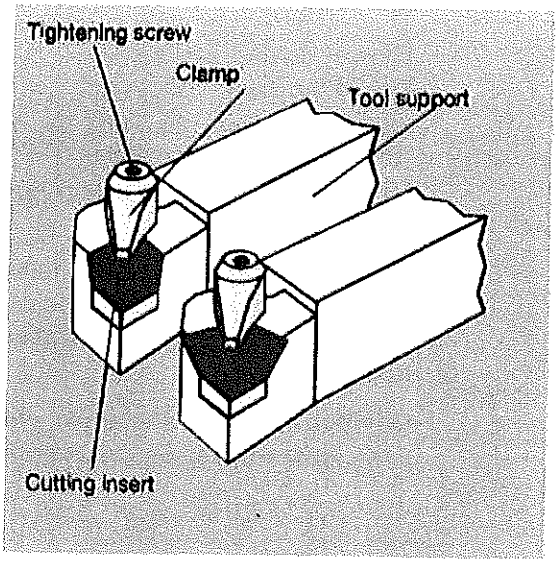
Section – C

04X06 = 24 Marks

15. What do you understand by Ceramics and explain their types?

Ans



Ceramic cutting materials

Ceramic cutting materials are even harder and more abrasion resistant than hard metals.
Even when working at temperatures of up to 1200°C the material properties are not significantly impaired, with the result that a higher cutting speed can be selected. This advantage is offset by the fact that ceramic cutting materials are brittle and are very sensitive to large changes in cutting stresses. With ceramic cutting materials a distinction is drawn between oxide ceramics, composite ceramics and nitride ceramics.

- **Oxide ceramics** consist of pure aluminium oxide and are especially suitable for machining ferrous products.

- **Composite ceramics** consist of aluminium- oxide and mechanically resistant material, such as titanium nitride or titanium carbon nitride. Composite ceramics are especially suitable for machining hardened ferrous materials and for dressing grey castings.

- **Nitride ceramics** are based on silicon nitride. The advantages of this material lie in its high fracture toughness and high resistance to thermal shock at large rates of feed. Nitride ceramics are less abrasively resistant when machining steels and so tend to be preferred for working grey castings.

16. Calculate thread of M16X2,: -

Ans.(a). Thread depth = 0.614 ×pitch

= 0.614 ×2

= 1.228 mm (radially)

Thread depth (diametrically) = 2 ×1.228

= 2.456 mm

(b). Required Chamfer = $\frac{major\ dia.-minor\ dia.}{2} + 0.5$

$$= \frac{15.8-13.3}{2} + 0.5$$

= 2 mm (approx.)

(c). Minor diameter = major dia. – thread depth

= 15.8 – 2.5

= 13.3 mm

17. Write down the classification of thread?

3.4 Thread classifications

Threads are classified according to four factors:

1. Purpose

We distinguish between fastening threads and motion-transmitting threads.

- **Fastening threads**
  are generally single-threaded V-shaped threads with an included thread angle of 60° (55°) and a maximum lead angle of 5°.

  The frictional forces generated by fastening threads must be high enough to prevent the components from loosening by themselves.

  If a fastening thread fulfils this condition, it is self-locking.

- **Motion-transmitting threads**
  are used to convert rotational motion into linear motion or vice versa.

  Motion-transmitting threads have different profiles depending on the load and can be multi-threaded.

2. Direction of rotation

We distinguish between the following:

- Right-hand thread
- Left-hand thread

If you hold a screw vertically, the thread turns rise towards the right with a right-hand thread and towards the left with a left-hand thread.

Threads are normally right-handed.

A left-hand thread is only used if a right-hand thread would come unscrewed (e.g. grinding wheel fastening, turnbuckle, bicycle pedals) or if there is a risk of confusion (gas bottles).

LH (left hand) is added to the thread designation, e.g. M 16-LH.

3. Number of threads

We distinguish between the following:

- Single-threaded
- Multi-threaded

You can tell the number of thread turns from the thread starts.

Single-threaded is the most common type.

For the double-threaded type, the pitch is twice the pitch of the single-threaded type, which means that a large axial motion

4. Profile

Possible thread profiles include:

- V-shaped thread
- Trapezoidal thread
- Buttress thread
- Round thread

V-shaped thread

All V-shaped threads have small lead angles and are used as fastening threads. Their thread profile has a triangular shape.

We distinguish between the following:

- Metric ISO thread

They are manufactured as

- coarse threads and
- fine threads.

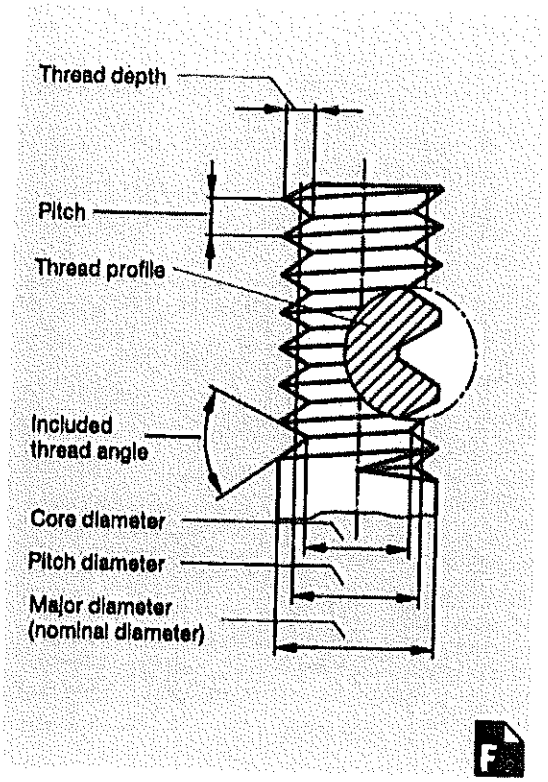
The nominal diameter d, core diameter d_1 and pitch diameter d_2, as well as the pitch P, are given in mm. The included thread angle is 60°.

- Whitworth thread

The major diameter d, core diameter d_1 and pitch diameter d_2 are given in inches. The pitch P is given in threads per inch; the included thread angle is 55°. Whitworth threads are divided into pipe threads according to DIN EN ISO 228 (internal and external thread cylindrical, pressure-tight joints are not made on the thread) and those according to DIN EN 10 226 (internal thread cylindrical, external thread tapered.

18. Write the designation of the thread?

Thread sizes



3.2 Designations on the thread

The key designations on the thread are:

- Nominal diameter: the external thread diameter
- Core diameter: on an external thread, this is the diameter of the remaining cross-section. On internal threads, it is approximately the same as the diameter of the bore hole.
- Pitch diameter: this is approximately halfway between the nominal diameter and the core diameter.
- Included thread angle: the included thread angle is the angle between the thread flanks.
- Pitch: the pitch is the axial distance from thread turn to thread turn.
- Thread depth: this indicates how far into the material the thread profile goes.
- Thread profile: this indicates the shape of the thread.