Adda247

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"There is nothing impossible to they who will try."

ISRO | BHEL | DRDO & OTHER PSUs

PRODUCTION

MACHINE TOOL

MOST EXPECTED QUESTIONS

Live@ 11:30Am

PART-2

Gaurav sir

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GATE 2023 RESULT

GATE

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AIR 219 ME RITISH KUMAR

AIR 258 EE MANAV

AIR 348 EE AMAN NAMDEV

AIR 392 EE GAURAV MAHAJAN

AIR 403 EC MOHAN KUMAR SINGH

AIR 567 EE SHANKAR JHA

AIR 571 ME VIJENDER MEENA

YouTube Classes Schedule

ENGINEERS

MECHANICAL ENGINEERING

EXAM TARGET	SUBJECT	TIME	FACULTY
ALL PSUs	ENGINEERING MATHS	10:00 AM	ANANT SIR
ALL PSUs	PRODUCTION	11:30 AM	GAURAV SIR
ALL PSUs	THERMODYNAMICS	3:00 PM	KANISTH SIR
GATE 2024-25	HMT	4:30 PM	YOGESH SIR
GATE 2024-25	SOM	9:00 PM	MUKESH SIR

FREE APP
CLASS SCHEDULE

MECHANICAL ENGINEERING

HMT	MONDAY Live @11AM	YOGESH SIR
PRODUCTION	TUESDAY Live @11AM	GAURAV SIR
SOM	WEDNESDAY Live @8PM	MUKESH SIR
THERMODYNAMICS	THURSDAY Live @11AM	KANISTH SIR
ENGINEERING MATHEMATICS	FRIDAY Live @11AM	ANANT SIR

Drilling
⇓
Boring
⇓
Reaming ⇒ Even no of flute

Reaming is primarily used for achieving

(a) Higher MRR

(b) Improved dimensional tolerance

(c) Fine surface finish

(d) Improved positional tolerance.

A milling cutter having 10 teeth is rotating at 100 rpm. The table feed is set at 50 mm per minute. The feed per tooth in mm is

(a) 5
(b) 0.5
(c) 0.2
(d) 0.05

Given Data :→

* $Z = 10$
* $N = 100$ rpm
* $f_m = 50$ mm/min
* $f_t = ?$

Solution :→ * $\boxed{f_m = f_t \times Z \times N}$

$$* f_t = \frac{f_m}{Z \times N}$$

$$* f_t = \frac{50}{10 \times 100} = 0.05$$

The time taken to drill a hole through a 25 mm thick plate with the drill rotating at 300 rpm and moving at a feed rate of 0.25 mm/rev is

(a) 10 sec
(b) 20 sec
(c) 60 sec
(d) 100 sec

Given data :→

* $t = 25$ mm
* $N = 300$ rpm
* $f = 0.25$ mm/rev
* $t_m = ?$

Solution :→ $t_m = \frac{L_e \leftarrow \text{mm}}{f \times N}$

mm/rev, rev/min

$L_e = t + X + A + 0$ (0, 0, 0)

$X = \frac{D/2}{\tan\frac{\alpha}{2}}$

$X = 0.5D \rightarrow TH$

$X = 0.3D \rightarrow BH$

$t_m = \frac{25 \times 100}{0.25 \times 300}$

$t_m = \frac{1}{3} \times 60 = 20$ sec

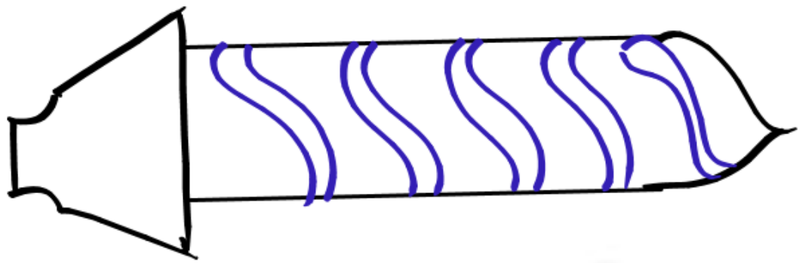
Group I

P: Dressing
Q: Loading
R: Glazing
S: Trueing

Group II

1. Blunting of grinding wheels
2. Shaping of grinding wheels
3. Sharpening of grinding wheels
4. Clogging of grinding wheels

	P	Q	R	S
(a)	2	1	4	3
(b)	3	1	4	2
(c)	3	4	1	2
(d)	4	3	1	2



The rake angle in drill

(a) Increases from center to periphery
(b) Decreases from center to periphery
(c) Remains constant
(d) Is irrelevant to the drilling operation.

Drill
⇓
Flute ⇒ chip flow ⇒ Rake face
⇓ ⇓
Rake Angle ⇒ Min at centre to max at periphery ⇐ Rake Angle
⇓
$(\alpha)_{Max}$ = Helix Angle

A lead screw with half nuts in a lathe, free to rotate in both directions has

(a) V-threads
(b) With-worth threads
(c) Buttress threads
(d) Acme threads

Lead screw
⇓
Thread cutting
⇓
Zero Rake Angle
⇓
Half Nut or Split Nut collect Lead Screw with carriage
⇓
ACME Thread on Lead Screw
⇓
29° Include Angle

Grinding Ratio = $\frac{V_m}{V_w}$

Grinding ratio is defined as

(a) $\frac{\text{Volume of wheel wear}}{\text{Volume of work material removed}}$

(b) $\frac{\text{Volume of work material removed}}{\text{Volume of wheel wear}}$

(c) $\frac{\text{Cutting speed}}{\text{feed}}$

(d) $\frac{\text{longitudinal feed}}{\text{transverse feed}}$

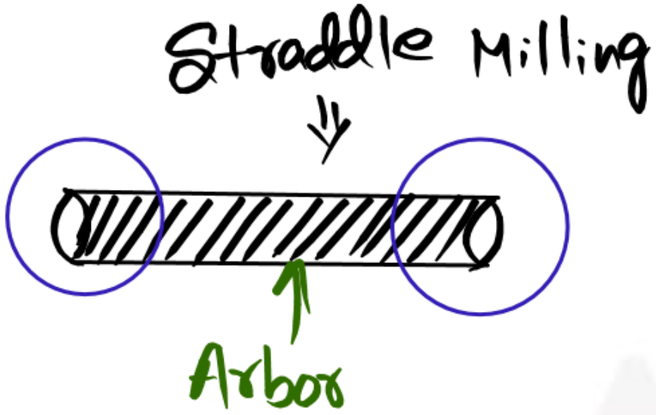
Which of the following is not a characteristic of the climb milling (down milling) operation ?

(a) The work piece is fed in the opposite direction.

(b) Forces are less.

(c) High rigidity of the machine tool is required.

(d) Chip thickness is maximum at the end of the cut.



In a milling machine two side milling cutters are mounted with a desired distance between them so that both sides of the work piece can be milled simultaneously. What is this set-up called ?

(a) Gang milling
(b) Straddle milling
(c) String milling
(d) Side milling

The ratio of time of return stroke to time of forward stroke of a shaping machine is 0.6. the stroke is 250 mm and it makes 30 double strokes per minute. What is the overall average speed of operation?

(a) 3.75 m/min.
(b) 5.0 m/min.
(c) 7.5 m/min.
(d) 12 m/min.

Which one of the following is **not** a feature of gear hobbing process ?

(a) High rate of production
(b) Generation of helical gears
(c) Very accurate tooth profile
(d) Generation of internal gears

A milling cutter of 70 mm diameter with 12 teeth is operating at a cutting speed of 22 m/min and a feed of 0.05 mm/tooth. The feed per minute is

(a) 110 mm/min (b) 35 mm/min

(c) 6 mm/min (d) 60 mm/min ✓

Given Data :→

* D = 70mm
* Z = 12
* V = 22 m/min
* f_t = 0.05 mm/tooth
* f_m = ?

Solution :→

* $f_m = f_t \times Z \times N$
* $f_m = 0.05 \times 12 \times 100$
* f_m = 60 mm/min

* $V = \frac{\pi D N}{1000}$ m/min
* $N = \frac{V \times 1000}{\pi \times D}$
* $N = \frac{22 \times 1000}{\pi \times 70}$
* $N = \frac{22 \times 1000 \times 7}{22 \times 70} = 100$

Match **List-I (Operation)** with **List-II (Application)** and select the correct answer using the codes:

List-I

A. Reaming
B. Boring
C. Counter boring
D. Counter sinking

List-II

1. Used for enlarging the end of a hole to give it a conical shape for a short distance
2. Used for enlarging only a limited portion of the hole
3. Used for finishing a hole
4. Used for enlarging a hole

Codes:

	A	B	C	D
(a)	3	2	4	1
(b)	1	4	2	3
(c)	3	4	2	1
(d)	1	2	4	3

In a shaping operation, the average cutting speed is (Stroke length S, number of stroke per minute N, Quick return ratio R)

(a) NSR (b) $NSR / 2$

(c) $NS(1 + R)$ (d) $NS(1 + R) / 2$

In a single pass drilling operation, a through hole of 15 mm diameter is to be drilled in a steel plate of 50 mm thickness. Drill spindle speed is 500 rpm, feed is 0.2 mm/rev and drill point angle is 118°. Assuming 2mm clearance at approach and exit, the total drill time (in seconds) is

(a) 35.1 (b) 32.4 (c) 31.2 (d) 30.1

Consider the following statements in respect of grinding wheel of specification, 51–A–36–L–7–R–23, using the standard alphanumeric codification:

1. Abrasive used in the wheel is aluminium oxide
2. The grain size of abrasive is medium
3. The wheel grade is medium hard
4. It has an open structure
5. It has resinoid as bonding agent

Which of these statements are correct?

(a) 1, 2 and 3 (b) 1, 3 and 4
(c) 2, 3 and 5 (d) 1, 4 and 5

A 400 mm long shaft has a 100mm tapered step at the middle with 4° included angle. The tailstock offset required to produce this taper on a lathe would be

(a) 400 sin 4°

(b) 400 sin 2°

(c) 100 sin 4°

(d) 100 sin 2°

Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I

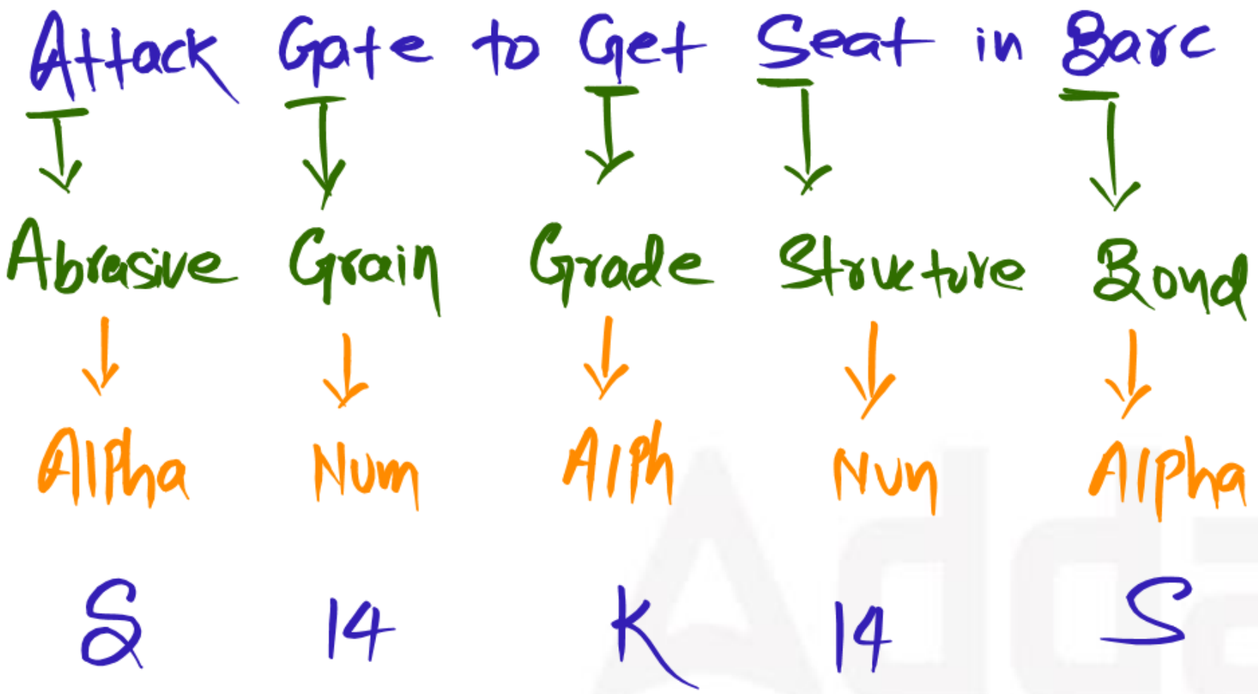
A. Reaming
B. Counter-boring
C. Counter-sinking
D. Spot facing

List-II

1. Smoothing and squaring surface around the hole for proper seating
2. Sizing and finishing the hole
3. Enlarging the end of the hole
4. Making a conical enlargement at the end of the hole

Codes:

	A	B	C	D
(a)	3	2	4	1
(b)	2	3	1	4
(c)	3	2	1	4
(d)	2	3	4	1



The sequence of markings "S 14 K 14 S" on a grinding wheel represents respectively

(a) bond type, structure, grade, grain size and abrassive type

(b) abrasive type, grain size, grade, structure and bond type

(c) bond type, grade, structure, grain size and abrasive type

(d) abrasive type, structure, grade, grain and bond type

Which one of the following sets of tools or tools and processes are normally employed for making large diameter holes?

(a) Boring tool

(b) BTA tool (Boring and Trepanning Association) and gun drill

(c) Gun drill and boring toll

(d) Boring tool and trepanning → Large dia Hole Without drilling

Which one of the following processes of gear manufacture results in best accuracy of the involute gear tooth profile?

(a) Milling

(b) Hobbing

(c) Rotary gear shaper

(d) Rack type gear shaper

Grinding wheel

Which is not related term of grinding

(a) Truing
(b) Dressing
(c) Buffing
(d) Glazing

Glazing
⇓
Dressing

Grinding

* finishing operation
* MPCT
* Max Sp. Energy
* Operate at High velocity

Specific cutting energy is more in grinding process compared to turning because

(a) grinding (cutting) speed is higher

(b) the wheel has multiple cutting edges (grains)

(c) ploughing force is significant due to small chip size

(d) grinding wheel undergoes continuous wear

A side and face cutter 125mm diameter has 10 teeth. It operates at a cutting speed of 14m/min with a table traverse 100mm/min.

The feed per tooth of the cutter is

(a) 10 mm (b) 2.86 mm

(c) 0.286 mm (d) 0.8 mm

Given data :→

* $D = 125$ mm
* $Z = 10$
* $V = 14$ m/min
* $f_m = 100$ mm/min
* $f_t = ?$

Solution :→

$$f_m = f_t \times Z \times N$$

$$f_t = \frac{f_m}{Z \times N}$$

$$f_t = \frac{100}{10 \times 35.65} = 0.285 \text{ mm/tooth}$$

$$V = \frac{\pi D N}{1000} \text{ m/min}$$

$$N = \frac{V \times 1000}{\pi D} = \frac{14 \times 1000}{\pi \times 125}$$

$$N = 35.65 \text{ rpm}$$

Given Data's →

* D = 31.8 mm = Drill dia
* t = 100 mm
* V = 20 m/min
* f = 0.3 mm/rev
* O = 4 mm
* A = 9 mm
* t_m = ?

A 31.8mm H.S.S. drill is used to drill a hole in a cast iron block 100mm thick at a cutting speed 20 m/min and feed 0.3 mm/rev. If the overtravel of drill is 4mm and approach 9mm, the time required to drill the hole is

(a) 1 min 40 s
(b) 1 min 44 s
(c) 1 min 49 s
(d) 1 min 53 s ✓

Solution :→

$$* t_m = \frac{Le}{f \times N}$$

$$* t_m = \frac{113}{0.3 \times \left(\frac{20 \times 1000}{\pi \times 31.8}\right)}$$

$$* t_m = \left[\frac{113 \times \pi \times 31.8}{0.3 \times 20 \times 1000}\right] \times 60$$

$$* t_m = 112.8 \text{ sec} = 1 \text{ min } 53 \text{ sec}$$

$$* Le = t + A + o$$

$$* Le = 100 + 9 + 4 = 113 \text{ mm}$$

$$* V = \frac{\pi D N}{1000} \text{ m/min}$$

$$* N = \frac{V \times 1000}{\pi \times D} = \frac{20 \times 1000}{\pi \times 31.8}$$

In a shaper machine, the mechanism for tool feed is

(a) Geneva mechanism

(b) Whitworth mechanism

(c) Ratchet and Pawl mechanism

(d) Ward-Leonard system

Shaper

⇓

Whitworth Quick Motion Mechanism during cutting operation

⇓

Feed on Tool during Return Stroke by Ratchet And Pawl Mechanism

Match List-I (Cutting Tools) with List-II (Applications) and select the correct answer using the codes given below the lists:

List-I

A. Trepanning tool

B. Side milling cutter

C. Hob cutter

D. Abrasive sticks

List-II

1. For surface finishing by honing

2. For machining gears

3. For cutting keyways in shafts

4. For drilling large diameter holes.

Codes:

	A	B	C	D
(a)	1	3	2	4
(b)	4	3	2	1
(c)	1	2	3	4
(d)	4	2	3	1

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