Adda247

# WELCOME TO Adda247

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

ISRO | BHEL | DRDO & OTHER PSUs

# PRODUCTION

# MACHINE TOOL

## MOST EXPECTED QUESTIONS

## PART-1

Live@ 11:30Am

Gaurav sir

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# GATE 2023 RESULT

GATE

Congratulations
FROM ADDA 247 FAMILY

AIR 03 ME KUSHAGRA DUTT

AIR 05 PI HARSHIT KUMAR

AIR 07 ME RUSHI PRADIPKUMAR KARIYA

AIR 11 CE VINEET JAIN

AIR 30 CE RITIK BANSAL

AIR 36 ECE SUMIT KUMAR

AIR 64 CE UTKARSH MISHRA

AIR 71 EE SONESH SANJAY PAWAR

AIR 76 CE DIPANKAR DAS

AIR 87 EC SURAJIT RABI DAS

AIR 91 EE RISHABH GUPTA

AIR 111 ES ANIL GUPTA

AIR 130 EE SAURAV PATEL

AIR 136 CE RUPESH SACHDEVA

AIR 200 ECE WASIUZZAMA

AIR 212 IN WASIUZZAMA

AIR 217 ME VISHAL KUMAR

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 |

Among the conventional machining processes, maximum specific energy is consumed in

(a) Turning
(b) drilling
(c) planning
(d) grinding → 50 J/mm³

Non-conventional
⇓
ECM → 500 J/mm³

Trepanning is performed for

(a) finishing a drilled hole

(b) producing a large hole without drilling

(c) truing a hole for alignment

(d) enlarging a drilled hole

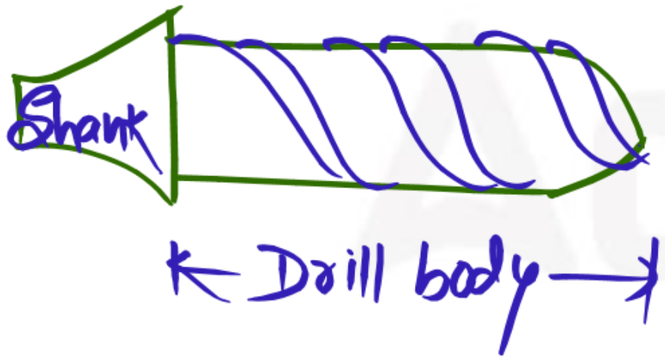
Reamer is designed to have even number of flutes to:

(a) Balance the cutting forces
(b) Conform to shop floor standard
(c) Enable measurement of the reamer diameter
(d) Help in regrinding of reamer.

Drilling
⇓
Boring
⇓
Reaming ⇒ To obtained Excellent surface finish

The cutting portion of a drill is to be welded to its shank. The process best suited for this is

(a) ultrasonic welding
(b) electron beam welding
(c) friction welding
(d) laser welding



Grinding wheel
⇓
Regrind

Tool life in the case of a grinding wheel is the time

(a) between two successive regrinds of the wheel
(b) taken for the wheel to be balanced
(c) taken between two successive wheel dressings
(d) taken for a wear of 1 mm on its diameter

The teeth of both external and internal spur gears can be cut on

(a) milling machine
(b) gear shaping machine
(c) gear hobbing machine
(d) gear shaving machine

Surface Roughness (h)

$\Downarrow$

$* \downarrow h = \frac{\downarrow f^2}{8R}$

$* h\downarrow \Rightarrow$ Surface finish $\uparrow$

**In turning operation the surface finish can be improved by decreasing**

(a) cutting speed
(b) Feed per revolution ✓
(c) Rake angle
(d) Nose radius

The final finishing process for the surface plate made of cast iron which is used as a reference surface is

(a) Buffring → Super finishing operation
(b) Grinding → finishing operation
(c) Hand scraping
(d) honing → Super finishing operation

Cylindrical / Internal finishing

Superfinishing operation

Honning < Lapping < Buffusing

Which of following gear manufacturing processes is based on generation principle.

(a) Gear hobbing
(b) Gear shaping
(c) Gear milling
(d) gear shaving

Which of the following powder production methods produces spongy and porous particles?

(a) Atomization
(b) Reduction of metal oxides → Spongy or Porous Particles
(c) Electrolytic deposition
(d) Pulverization

A side and face cutter 125mm diameter has 10 teeth. It operates at a cutting speed of 14m/min with a table traverse 100 mm/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
* Table Traverse $= 100$ mm/min
* feed/teeth $= ?$

$\Downarrow$

$f_t = ?$

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

$f_m$ → mm/min, $f_t$ → mm/tooth, $Z$ → teeth/rev, $N$ → rev/min

Solution :→

* $f_m = f_t \times z \times N$

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

* $f_t = \frac{100 \rightarrow mm/min}{10 \times 35.67}$

* $f_t = 0.28\ mm/tooth$

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

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

* $N = 35.67$

Blind hole 10mm diameter, 50mm deep are being drilled in steel block, drilling spindle speed is 600rpm, feed 0.2mm/rev, point angle of drill is 120.

Machining time in mm ) per hole will be

(a) 0.08
(b) 0.31
(c) 0.44
(d) 0.86

During the above operation, the drill wears out after producing 200 holes. Taylor's tool life equation is of the form $VT^{0.3} = C$, where V cutting speed in m/min and T = tool life in mm. Taylor's constant C will be

(a) 15
(b) 72
(c) 93
(d) 490

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

A milling cutter having 8 teeth is rotating at 150 rpm. If the feed per tooth is 0.1 mm, the speed in mm per minute is

(a) 120
(b) 187
(c) 125
(d) 70

Given Data :→

* $Z = 8$
* $N = 150$ rpm
* $f_t = 0.1$ mm/teeth
* $f_m = (\text{mm/min}) = ?$

Solution :→

$f_m$ (mm/min) $= f_t$ (mm/teeth) $\times Z$ (teeth/rev) $\times N$ (rev/min)

$f_m = 0.1 \times 150 \times 8$

$f_m = 120$ mm/min

Helix angle of fast helix drill is normally

(a) 35 deg

(b) 60 deg

(c) 90 deg

(d) 5 deg

The hardness of a grinding wheel is determined by the

(a) hardness of abrasive grains
(b) ability of the bond to retain abrasives
(c) hardness of the bond
(d) ability of the grinding wheel to penetrate the work piece

Strong screw threads are produced by

(a) thread milling
(b) thread chasing
(c) thread cutting with single point tool
(d) thread rolling

Through holes of 10 mm diameter are to be drilled in steel plate of 20 mm thickness. Drill spindle speed is 300 rpm, feed 0.2 mm/rev and drill point angle is 120°. Assuming drill over travel of 2mm the time for producing a hole will be

(a) 4 seconds
(b) 25 seconds
(c) 100 seconds
(d) 110 seconds

Given Data :→ Through Hole

* $D = 10mm$
* $t = 20mm$
* $N = 300 rpm$
* $f = 0.2 mm/rev$
* $\alpha = 120^\circ$
* $o = 2mm$
* $t_m = ?$

Solution :→

$$* \; t_m = \frac{t + X + A + o}{f \times N}$$

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

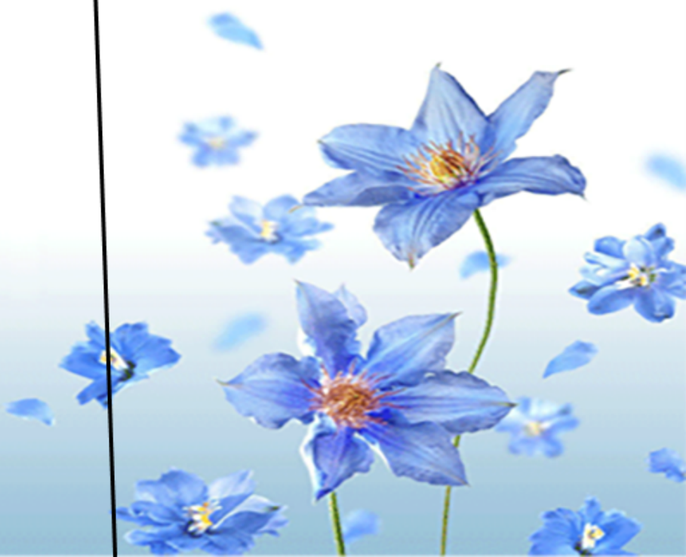
$$* \; Le = t + X + A + o$$

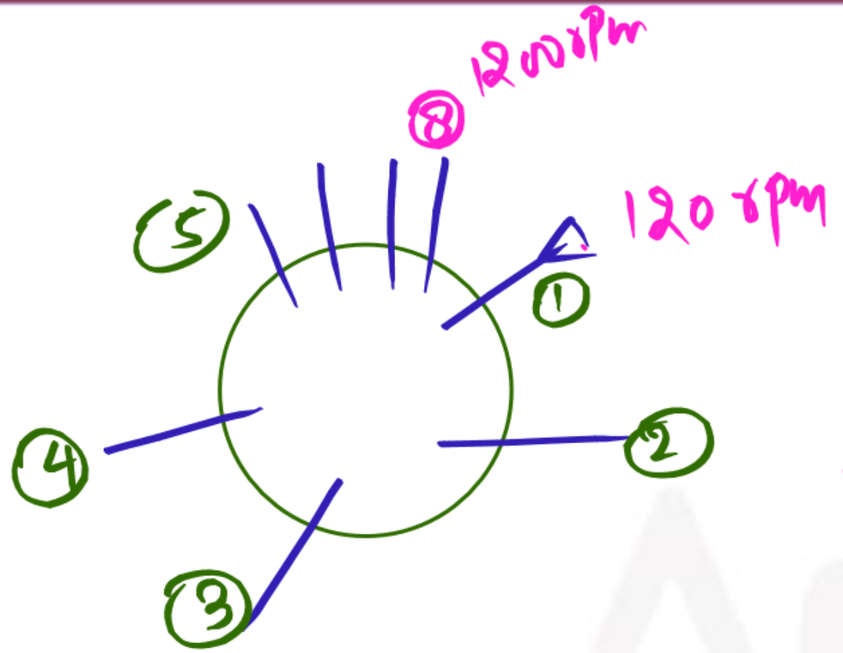
$$* \; Le = t + X + o$$

$$* \; Le = 20 + 2 + X$$

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

$$* \; X = \frac{5}{\tan 60}$$






. A drilling machine has to be designed with 8 spindle speeds ranging approximately between 120 to 1200 rpm. The 5th spindle speed is

(a) 445
(b) 480
(c) 620
(d) 865

* $N_{min} = 120$ rpm
* $N_{max} = 1200$ rpm
* $N_5 = ?$

Solution :→ G.P ⇒ Drilling spindle speed

* $t_m = a(r)^{n-1}$

* $N_{max} = N_{min}(r)^{n-1}$

* $(r)^{8-1} = \frac{N_{max}}{N_{min}}$

* $r^7 = \frac{N_{max}}{N_{min}}$

* $r = \left(\frac{1200}{120}\right)^{1/7} = 1.389$

* $N_1 = 120 rpm$

* $N_2 = 120 \times 1.389$

* $N_3 = 120 \times 1.389 \times 1.389$

* $N_4 = 120 \times 1.389 \times 1.389 \times 1.389$

* $N_5 = 120 \times 1.389 \times 1.389 \times 1.389 \times 1.389$

* $N_6 =$

* $N_7$

* $N_8 = 1200 rpm$

* $N_S = N_1 \times (r)^{n-1}$

* $N_S = 120 \times (1.387)^{5-1}$

* $N_S = 120 \times (1.387)^{4} = 447 \text{ rpm}$

Find the speed range ratio for the drilling machine spindle if the minimum and maximum diameters of drills used are 5 mm and 25 mm respectively and if the machinability indices for the work materials are 120 (brass) and 40 (alloy steel)

(a) 3/5
(b) 5/3
(c) 5
(d) 15

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