Adda247

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

ISRO | BHEL | DRDO & OTHER PSUs

PRODUCTION

METROLOGY

MOST EXPECTED QUESTIONS

Live@ 11:30Am

PART-2

Gaurav sir

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Gate Adda247

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GATE 2023 RESULT

GATE

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FROM ADDA 247 FAMILY

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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

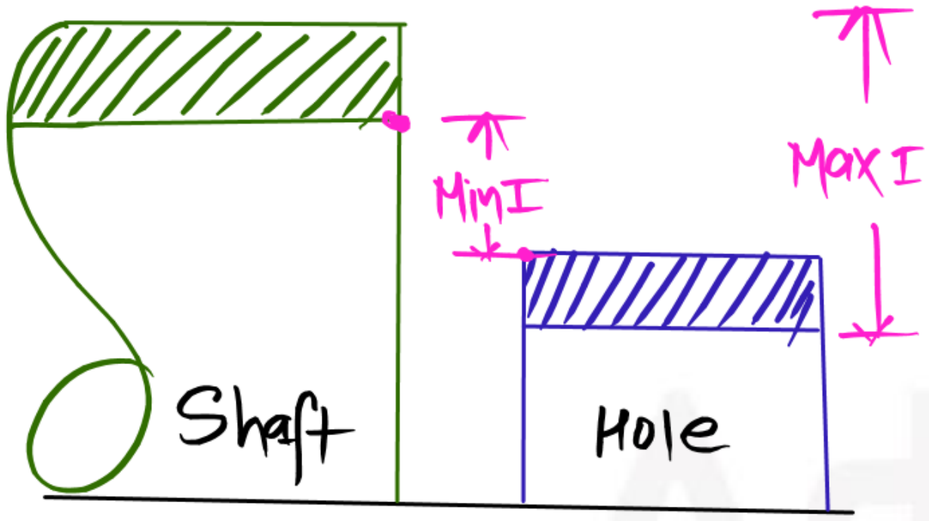
MECHANICAL ENGINEERING

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



In order to have interference fit, it is essential that the lower limit of the shaft should be

(a) Greater than the upper limit of the hole

(b) Lesser than the upper limit of the hole

(c) Greater than the lower limit of the hole

(d) Lesser than the lower limit of the hole

Interference fit joints are provided for:

(a) Assembling bush bearing in housing

(b) Mounting heavy duty gears on shafts

(c) Mounting pulley on shafts

(d) Assembly of flywheels on shafts

Consider the following joints:

1. Railway carriage wheel and axle
2. IC engine cylinder and liner

Which of the above joints is/are the result(s) of interference fit?

(a) 1 only
(b) 2 only
(c) Neither 1 nor 2
(d) Both 1 and 2

Hole $50^{+0.02}_{-0.00}$ mm → UL = 50.02mm, LL = 50mm

Shaft $50^{+0.02}_{+0.00}$ mm → UL = 50.02mm, LL = 50mm

Transition fit

Dimension of the hole is $50^{+0.02}_{-0.00}$ mm and shaft is $50^{+0.02}_{+0.00}$ mm.

The minimum clearance is

(a) 0.02 mm (b) 0.00 mm

(c) -0.02 mm (d) 0.01 mm

$\text{Min}c = 50 - 50.02 = -0.02\text{mm}$ = Max I

Hole $40^{0.050}_{0.00}$ mm → UL = 40.050mm, LL = 40mm

Minc = 0.01mm

Tolerance on shaft = 0.04mm

Max C = ?

Tolerance on Hole = 40.050 − 40 = 0.050mm

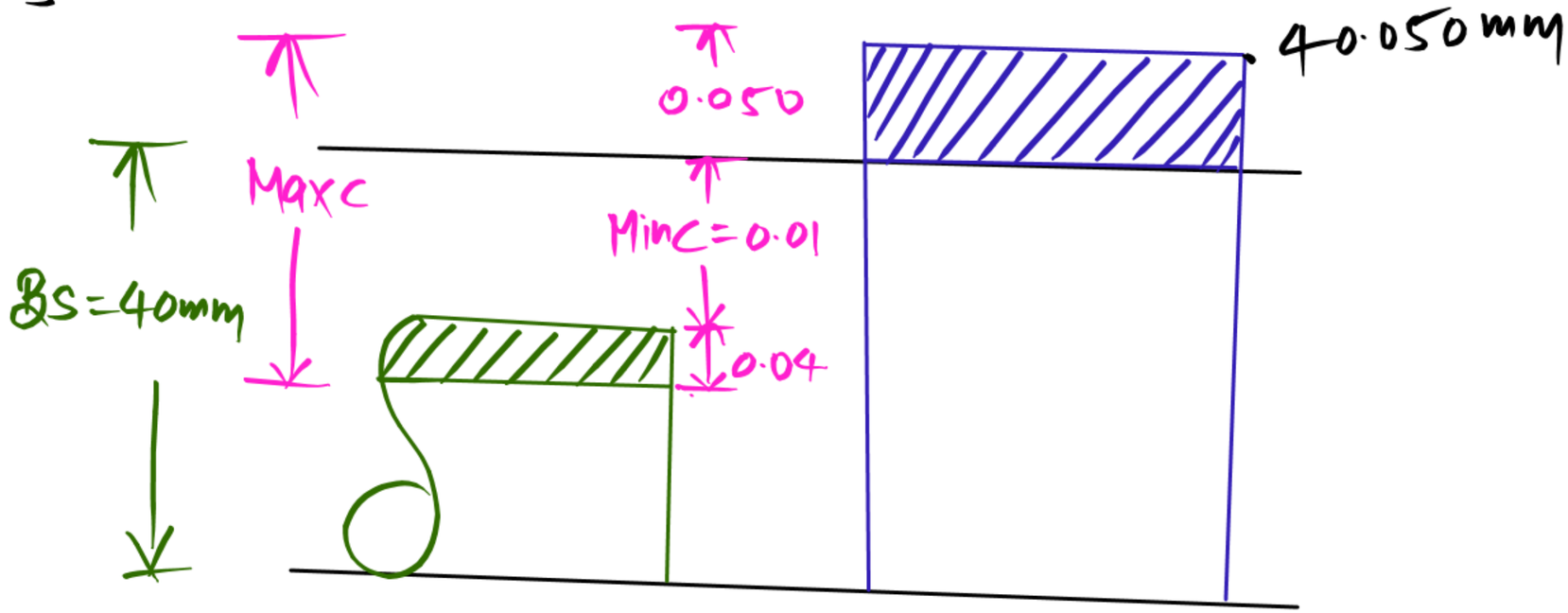
A hole is specified as $40\ ^{0.050}_{0.000}$ mm. The mating shaft has a clearance fit with minimum clearance of 0.01 mm. The tolerance on the shaft is 0.04 mm. The maximum clearance in mm between the hole and the shaft is

(a) 0.04 (b) 0.05

(c) 0.10 ✓ (d) 0.11

* Maxc = 0.04 + 0.01 + 0.05

* Maxc = 0.10 mm



Which one of the following tolerances set on inner diameter and outer diameter respectively of headed jig bush for press fit is correct?

(a) G_7 h 6 (b) F_7 n6

(c) H $_7$h 6 (d) F_7j6

* Go Plug Gauge = L.L of Hole

* No Go Plug Gauge = U.L of Hole

* Go Gap Gauge = U.L of Shaft

* No Go Gap Gauge = L.L of Shaft

Which one of the following statements is TRUE?

a) The 'GO' gage controls the upper limit of a hole

b) The 'NO GO' gage controls the lower limit of a shaft

c) The 'GO' gage controls the lower limit of a hole

d) The 'NO GO' gage controls the upper limit of a hole

b, c, d

A feeler gauge is used to check the

(a) Pitch of the screw

(b) Surface roughness

(c) Thickness of clearance

(d) Flatness of a surface

CLA value and RMS values are used for measurement of

(a) Metal hardness

(b) Sharpness of tool edge

(c) Surface dimensions

(d) Surface roughness

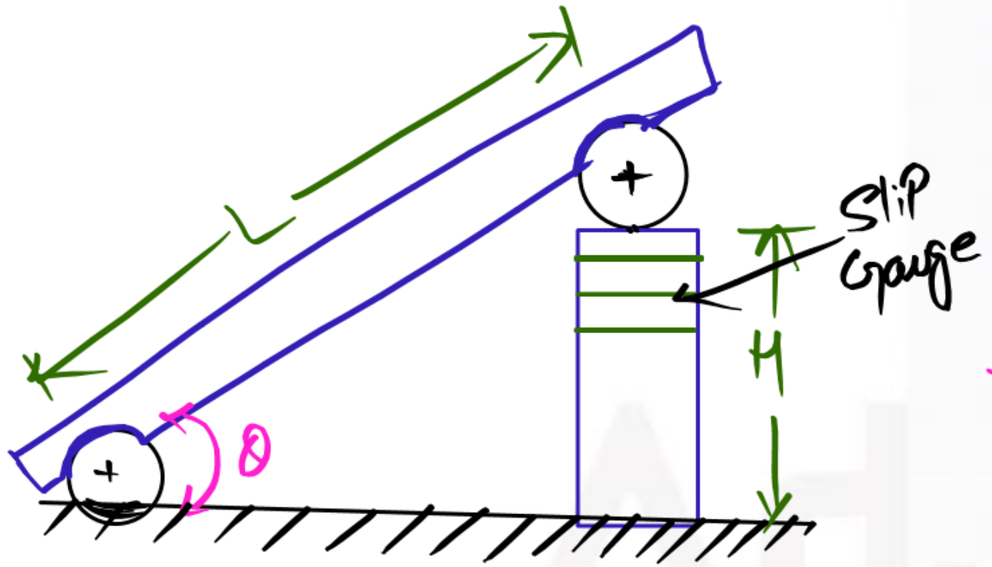
Surface roughness on a drawing is represented by

(a) Triangles

(b) Circles

(c) Squares

(d) Rectangles



$$\sin\theta = \frac{H}{L}$$

$$\theta = \sin^{-1}\left(\frac{H}{L}\right)$$

A sine bar is specified by

(a) Its total length

(b) The size of the rollers

(c) The centre distance between the two rollers

(d) The distance between rollers and upper surface

A sine bar has a length of 250 mm. Each roller has a diameter of 20 mm. During taper angle measurement of a component, the height from the surface plate to the centre of a roller is 100 mm.

The calculated taper angle (in degrees) is

(a) 21.1 (b) 22.8 (c) 23.6 (d) 68.9

* $L = 250mm$
* $D = 20mm \Rightarrow r = 10mm$
* $\theta = ?$
* $H + r = 100mm$
* $H = 90mm$

Solution:→ * $\sin\theta = \frac{H}{L} = \frac{90}{250}$

* $\theta = \sin^{-1}\left(\frac{90}{250}\right)$
* $\theta = 21.2^{0}$

Which one of the following instruments is a comparator ?

(a) Tool Maker's Microscope

(b) GO/NO GO gauge

(c) Optical Interferometer

(d) Dial Gauge

60f8

* BS = 60mm

* Tolerance of Shaft = IT8 = 25i

* F.D of "f" = $-5.5D^{0.41}$

* L.L of Shaft = ?

* U.L of Shaft = ?

What are the upper and lower limits of the shaft represented by 60 f8?

Use the following data:

Diameter 60 lies in the diameter step of 50-80 mm.

Fundamental tolerance unit,

i, in μ m = $0.45 D^{1/3} + 0.001D$, where D is the representative size in mm;

Tolerance value for IT8 = 25i.

Fundamental deviation for 'f shaft = $-5.5D^{0.41}$

(a) Lower limit = 59.924 mm, Upper Limit = 59.970 mm

(b) Lower limit = 59.954 mm, Upper Limit = 60.000 mm

(c) Lower limit = 59.970 mm, Upper Limit = 60.016 mm

(d) Lower limit = 60.000 mm, Upper Limit = 60.046 mm

Solution → * 6of8

* $D = \sqrt{50 \times 80} = 63.246\,mm$

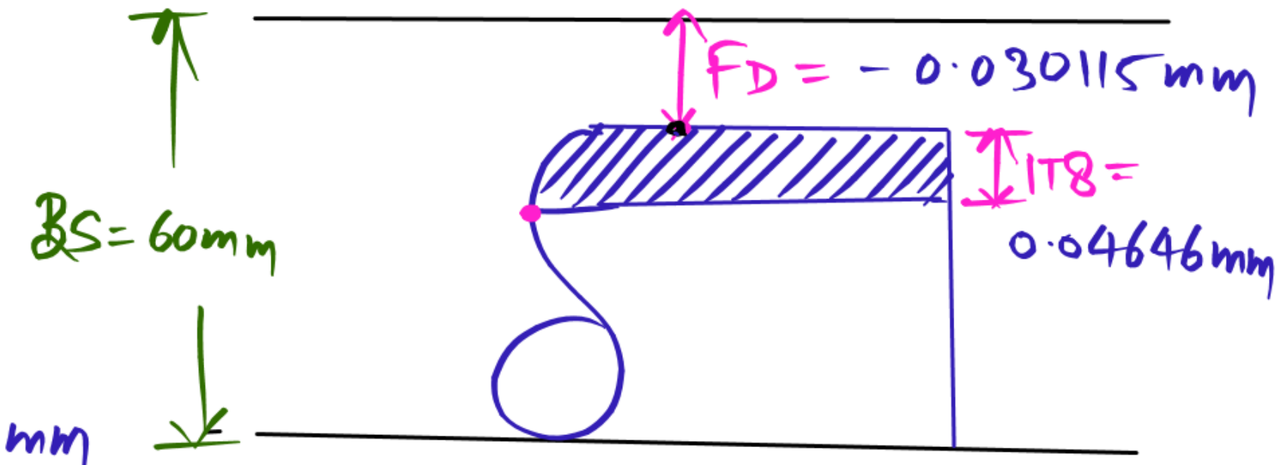
* $i = 0.45(63.246)^{1/3} + 0.001 \times (63.246)\ \mu m$

* $i = 1.859\,\mu m = 0.001859\,mm$

* $IT8 = 25i = 25 \times 0.00186 = 0.04646\,mm$

* $F_D = -2.5D^{0.41} = -5.5 \times (63.246)^{0.41}$

* $F_D = -0.030115\,mm$



* UL of shaft = 60 - 0.030115 = 59.970mm

* LI of Shaft = 59.970 - 0.04646

= 59.924mm

2548

Following data are given for calculating limits of dimensions and tolerances for a hole: Tolerance unit i (in μm) = $0.45\sqrt[3]{D} + 0.001D$. The unit of D is mm. Diameter step is 18-30 mm. If the fundamental deviation for H hole is zero and IT8 = 25 i, the maximum and minimum limits of dimension for a 25 mm H_8 hole (in mm) are

(a) 24.984, 24.967

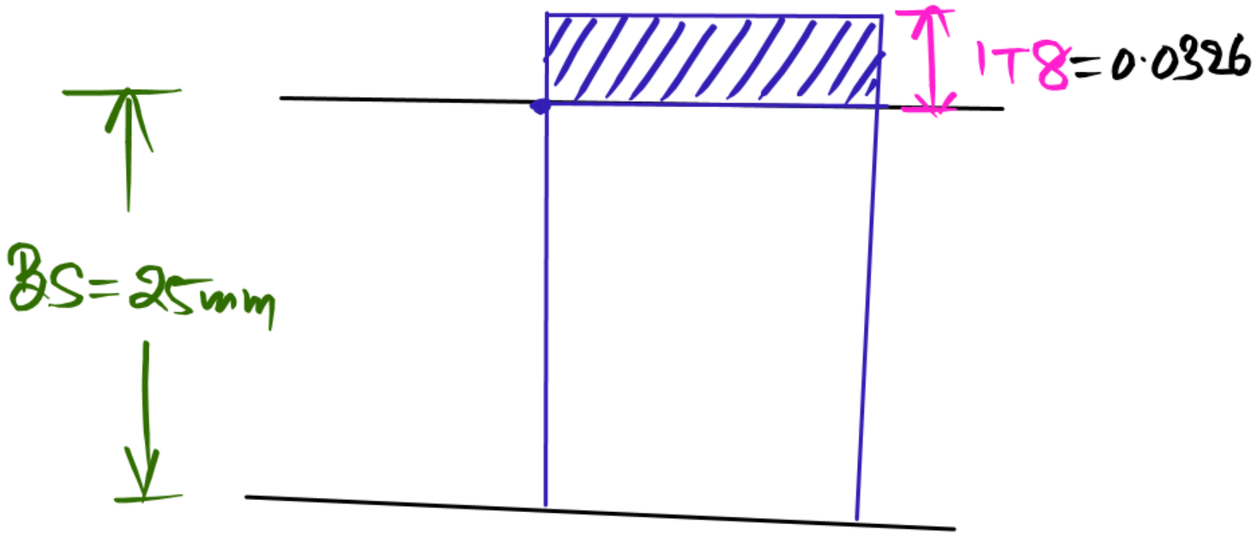
(b) 25.017, 24.984

(c) 25.033, 25.000

(d) 25.000, 24.967

09 25H8

* BS = 25 mm
* Tolerance of Hole = IT8 = 25i
* $D = \sqrt{D_1 \times D_2} = \sqrt{18 \times 30} = 23.23$ mm



* $i = 0.45(D)^{1/3} + 0.001D$ micron
* $i = 0.45(23.23)^{1/3} + 0.001 \times 23.23$ micron
* $i = 1.3076\ \mu m = 1.3076 \times 10^{-3}$ mm
* Tolerance of Hole = IT8 = 25i = $25 \times 1.3076 \times 10^{-3}$
  = 0.0326 mm

* LL of Hole = BS = 25 mm
* UL of Hole = 25 + 0.0326 = 25.0326 mm

A fit is specified as 25H8/e8. The tolerance value for a nominal diameter of 25 mm in IT8 is 33 microns and fundamental deviation for the shaft is - 40 microns. The maximum clearance of the fit in microns is

(a) -7
(b) 7
(c) 73
(d) 106

Which of the following is a joint formed by interference fits?

(a) Joint of cycle axle and its bearing

(b) Joint between I.C. Engine piston and cylinder

(c) Joint between a pulley and shaft transmitting power

(d) Joint of lathe spindle and its bearing

(Op) * D = 25mm = BS

* Hole Tolerance = ±0.015mm

* Gauge Tolerance = 10% work Tolerance

(Op) Hole $25^{\pm 0.015}$ mm

A GO-NOGO plug gauge is to be designed for measuring a hole of nominal diameter 25 mm with a hole tolerance of ± 0.015 mm. Considering 10% of work tolerance to be the gauge tolerance and no wear condition, the dimension (in mm) of the GO plug gauge as per the unilateral tolerance system is

(a) $24.985^{+0.003}_{-0.003}$

(b) $25.015^{+0.000}_{-0.006}$

(c) $24.985^{+0.03}_{-0.03}$

(d) $24.985^{+0.003}_{-0.000}$ ✓

Solution :→ $25^{\pm 0.015}$ mm

* UL of Hole = 25.015 mm
* LL of Hole = 24.985 mm
* Tolerance = 0.030mm
* Gauge Tolerance = $\frac{10}{100} \times 0.030 = 0.003$mm

* Go Plug Gauge Dimension = $24.985^{+0.003}$ mm
* NO-Go Plug Gauge Dimension = $25.015^{-0.003}$ mm

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