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بابل- قسم الميكانيك/المعهد التقني
مدرس

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(129)

(CAB)

→
(0,33,72)

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Analysis Sequencing of Manufacturing Processes of the Industrial Products

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Abstract:

The study immediately aims to prepare technical path to manufacture three industrial products because of its unavailable in local markets where two of its use for translating of motion in the lathe machine and one use for translating of motion in an internal combustion engine where introduce the best percentage loading time(exploit) on the productivity machine and an addition to calculate of waiting time on it. This research deals manufacturing that products in the sequencing workshop includes three productivity machine are (lathe, milling, grinding) where for every machine one operator with calculates operating time to those products depending upon scientific rules at any stage of operations machine to arrive the best sequencing which is giving the total of shorter time to executive an industrial sequencing operations upon

productivity machine then those products are testing then dealing by heat treatment and cooling with special rates to add limited specifications. An effects appear that (CAB) is an optimal sequencing which finishing productivity cycle with time(129)minutes and the waiting time(0,33,72) minutes upon productivity machine.

Keywords: Optimal Sequencing, Technological Path, Operating Time .

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(n)

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-:[B.S.Bhatia,2008]

$$\begin{aligned} & \cdot (P_i) \qquad \qquad \qquad (W_i) \\ (i) \qquad \qquad \qquad (C_i) \qquad (i) \qquad \qquad \qquad (d_i) \\ & \cdot (L_i=C_i-d_i) \qquad (L_i) \qquad \qquad \qquad (i) \end{aligned}$$

$$(n!) \qquad \qquad \qquad (m) \qquad \qquad \qquad (n)$$

-:[Philip E.Hicks,2008, Denni Blumenfeld,2001]

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-: [Ravin Ravindran,2007]

(n) -

(m) -

:

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(n) - -

(A,B,C)

(n)

(C) (B), (A)

(n)

(n!)

[Henri Fayol,2008]

- -

steel-)

(55, steel-37

:-[Mikell P.Groover,2002, PN Rao,2004]

$$T = \frac{L+C}{f \times N} \times I \quad (1) \quad \text{يستخدم للتشغيل الطولي} \quad \begin{matrix} \cdot (\text{min}) \\ \cdot (\text{mm}) \end{matrix} \quad \begin{matrix} = T \\ =L \\ =C \end{matrix}$$

$$T = \frac{\frac{1}{2}d + C}{f \times N} \times I \quad (2) \quad \text{التشغيل الوجهي للأقطار الصلدة} \quad \begin{matrix} \cdot (\text{r.p.m}) \\ \cdot (\text{mm/rev}) \end{matrix} \quad \begin{matrix} =N \\ =f \end{matrix}$$

$$T = \frac{\frac{1}{2}(d + d_o)}{f \times N} \times I \quad (3) \quad \text{التشغيل الوجهي للأقطار المجوفة} \quad \begin{matrix} \cdot (\text{mm}) \\ \cdot (\text{mm}) \end{matrix} \quad \begin{matrix} =I \\ =D \end{matrix}$$

$$I = \frac{d_{\text{total}}}{h_o} = \frac{\frac{1}{2}(D - d)}{h_o} \quad (4) \quad \text{لإيجاد عدد الأشواط} \quad \begin{matrix} \cdot (\text{mm}) \\ \cdot (\text{mm}) \\ \cdot (\text{mm}) \end{matrix} \quad \begin{matrix} =d \\ =d_o \\ =h_o \end{matrix}$$

$$\quad \quad \quad \cdot (\text{mm}) \quad =d_{\text{total}}$$

: (-)

$$T = \frac{\frac{1}{2}d + C}{f \times N} \times I = \frac{\frac{1}{2} \times 32 + 0}{1 \times 260} \times 32 = 2 \text{ min}$$

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$$\frac{P}{A} = \frac{P_1}{A_1} + \frac{P_2}{A_2}$$

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-:

(A)

-:

(B)

-:

(C)

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(

A - -

(-)

(steel-37)

(A)

(160mm)

(32mm)

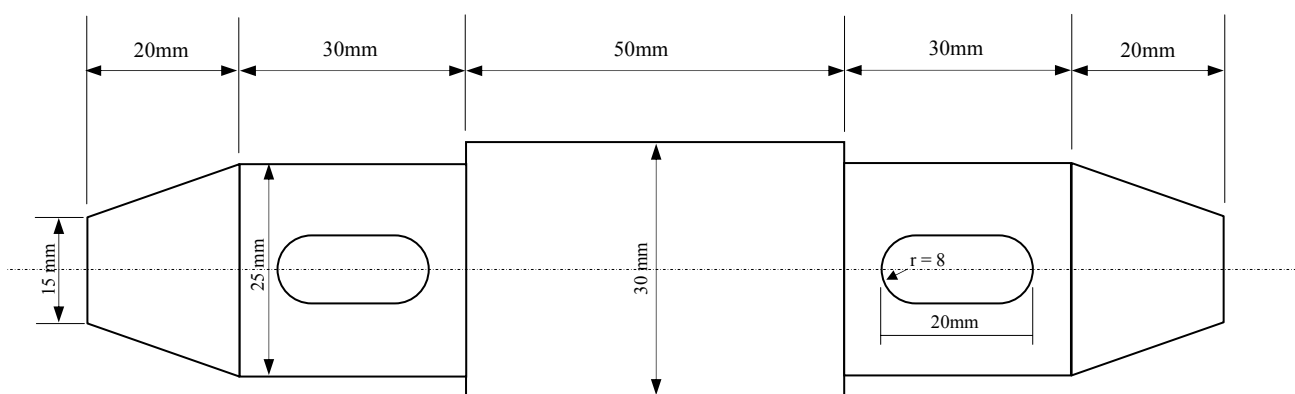
(3m)

(32mm)

(150mm)
 () (25mm) (50mm)
 (15mm) (25mm) (20mm)
 .() (30mm) (50mm)
 ()
 (25mm) (3mm) (8mm) (20mm)
 () (30mm)
 ()
 .(-)

(900 c°)

(780 c°)



A الشكل (٦-١) الأبعاد التصميمية للمنتج

(-) A

			d	I	L	f	N		
		mm	m m	----- -	mm	mm/r ev	r.pm		
,	,								1 L
,	,					,			2 L
,	,		-- -- -- -						3 L
,	,	,				,			4 L
,	,	,	-- -- --			,			5 L
	,	,	-- -- -- -			,		o	6 L
= , + , = + =									
,									1 M
,									2 M
	,		--- --			,			3 M
= , + , = + =									
,									1 G
,									2 G
	,	,				,			3 G
		,				,			4 G
	,	,			59	,			5 G
= , + , = + =									

B - -

(-)

(steel-55)

(B)

(130mm)

(30mm)

(7.5mm)

(30mm)

(15mm)

(30mm)

(15mm)

()

()

()

(3mm)

(6mm)

(10mm)

()

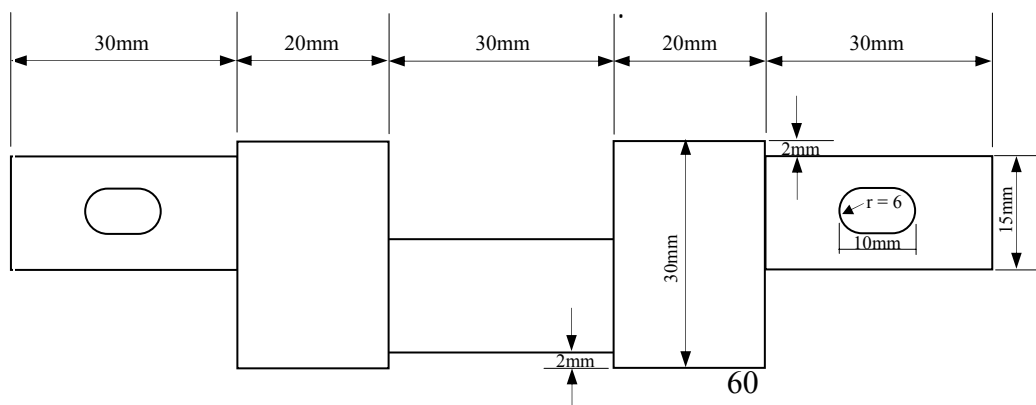
(B)

. (-)

(900 c°)

(870 c°)

(760 c°)



الشكل (٢-٦) الأبعاد التصميمية للمنتج B

B

(2-)

			d	I	L	f	N		
		mm	mm	---	mm	mm/re v	r.p.m		
,	,								1 L
	,					,			2 L
,	,	,	-----			,			3 L
	,	,	--			,			4 L
= , + , = + =									
,									1 M
,									2 M
						,			3 M
= + = + =									
,									1 G
		,				,			2 G
,		,				,			3 G
	,	,				,			4 G
= , + , = + =									

C - -

C

C

(-)

(steel-55)

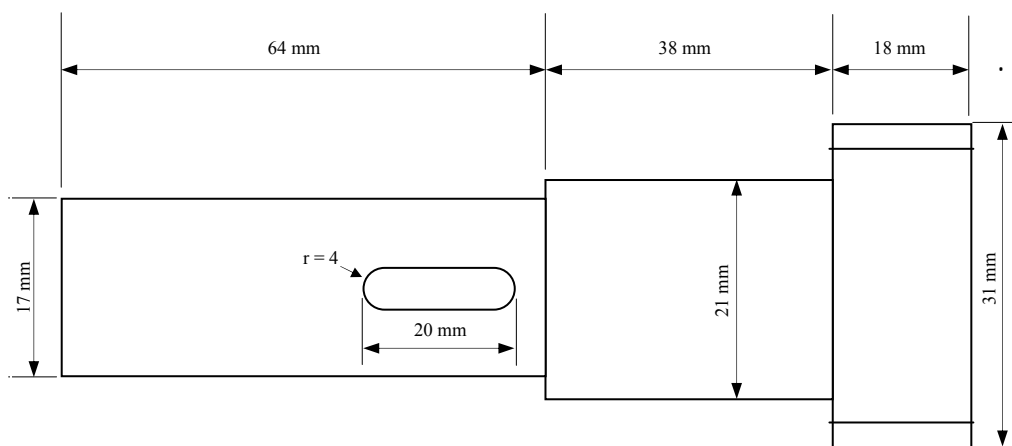
(B)

(130mm)
 (120mm)
 (17mm , 21mm , 31mm)
) (64mm , 38mm , 18mm)
 (
 (m)
 (m=1.5) (31mm)
 (2.2m) (20)
 (17mm) (3.3mm)
 (3mm) (4mm) (20mm)
 (21mm) (4mm) (17mm)
 ()
 C
 .(-)

(900 c°)

(870 c°)

(760 c°)



الشكل (٣-٦) الأبعاد التصميمية للمنتج C

C

(-)

			d	I	L	f	N		
		mm	mm	---	mm	mm/rev	r.p.m		
,	,								1 L
	,	,				,			2 L
,	,		-----						3 L
	,	,	-----			,			4 L
,	,	,				,			5 L
,	,	,	-----			,			6 L
		= , + , =				+		=	
,									1 M
,						,			2 M
,									3 M
		= + =				+		=	
,									1 G
,	,	,				,			2 G
,	,	,				,			3 G
,	,	,				,			4 G
		= , + , =				+		=	

(A,B,C)

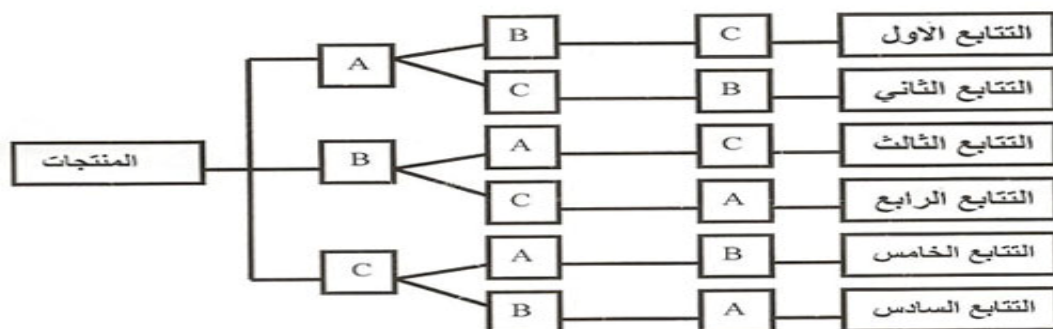
(!)

. (-)

(-4)

. (-)

(A,B,C)



(-)

(-)

A				
B				
C				

→
ABC - -

A		39		39					
B				81	84				
C							134	153	
		153-124=29		39+37+40+19=135			44+14+38=96		

→
ACB : - -7

A				39		39			44
C	39			72	82				
B			15				117	129	
		129-114=15		39+28+32+12=111			72		
		0		39			72		

→
BAC : - -

B		42		42	45		45	57	
A	42			81	86				
C									
		143-114=29		42+36+28+19=125			45+29+12=86		

\overrightarrow{BCA} - -

B		42							
C	42	75					85	104	
A	75	114		114	119				
	145-114=31			42+30+29+26=127			45+28+15=88		

\overrightarrow{CAB} - -

C									
A		72							
B	72								
	129-114=15			33+29+37+12=111			43+15+14=72		
	0			33					

\overrightarrow{CBA} - -

C									
B									
A									
	143-114=29			33+32+36+26=127			43+16+27=86		

$\vec{(CAB)}$

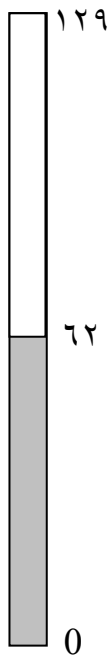
. (-)

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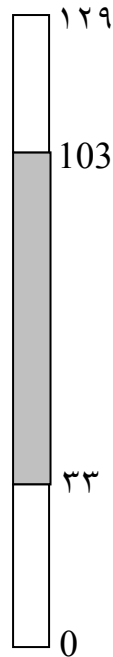
. (-)

(-)

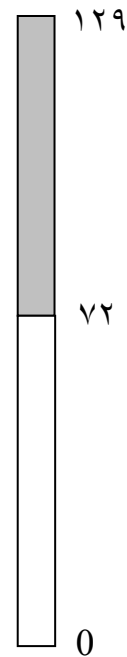
C	48%	52%	
A	54%	46%	
B	44%	56%	



المنتج C



المنتج A



المنتج B

-)	(-)		-:
()	$\overrightarrow{(ABC)}$		(
()	$\overrightarrow{(ACB)}$.
()	$\overrightarrow{(BAC)}$.
()	$\overrightarrow{(BCA)}$.
()	$\overrightarrow{(CAB)}$.
()	$\overrightarrow{(CBA)}$.
		$\overrightarrow{(CAB)}$	$\overrightarrow{(ACB)}$
			$\overrightarrow{(CAB)}$
(15,111,72)	$\overrightarrow{(C,A,B)}$.
			.
(0.52)		(0.48 0.54 44)	$\overrightarrow{(CAB)}$
()	$\overrightarrow{(CAB)}$, 0.46, 0.56

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