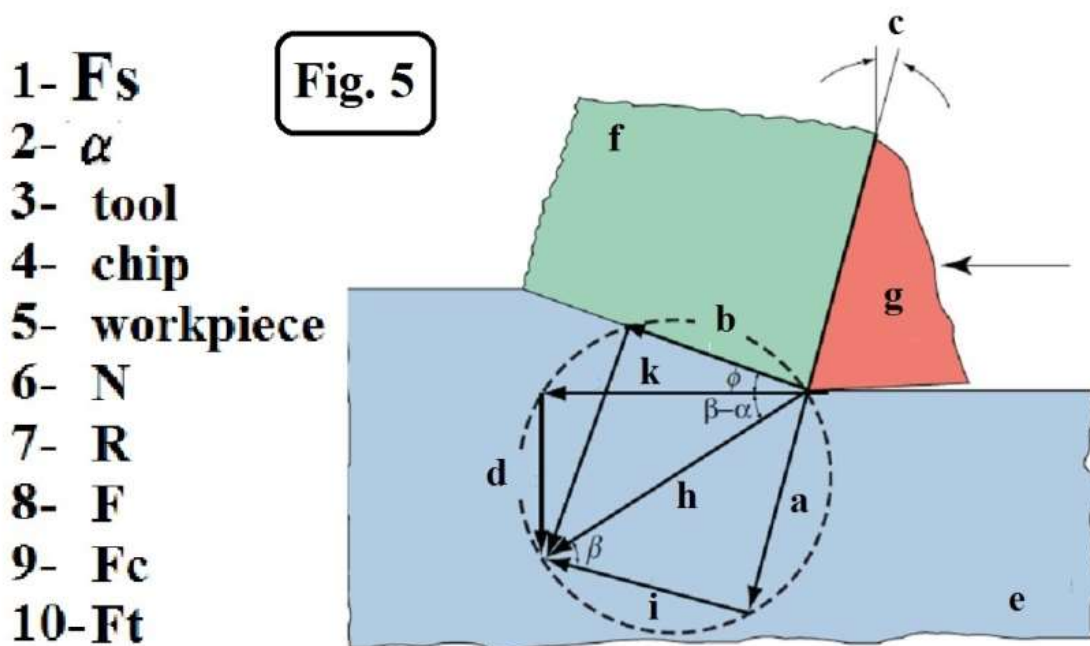


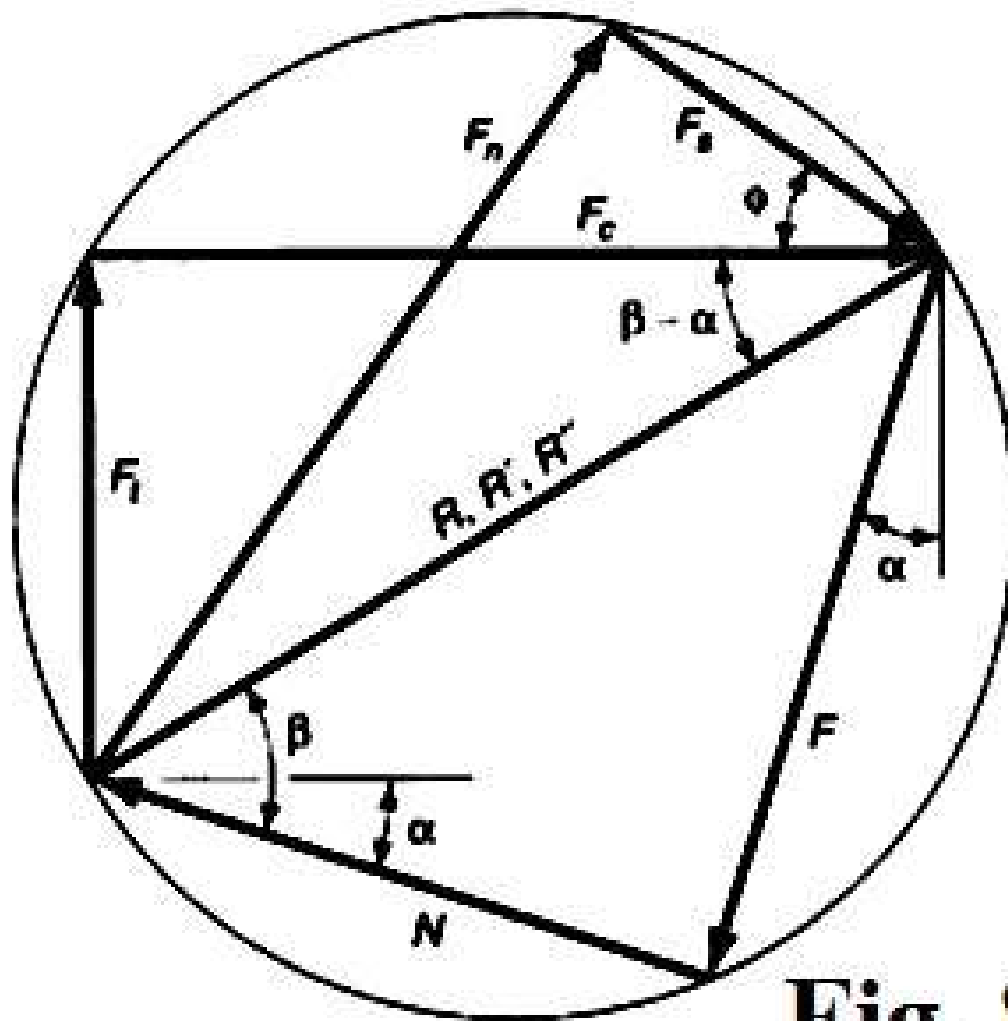
**Q3-A:** Write the number and right character for diagram shown in Fig. 5 (10 marks)



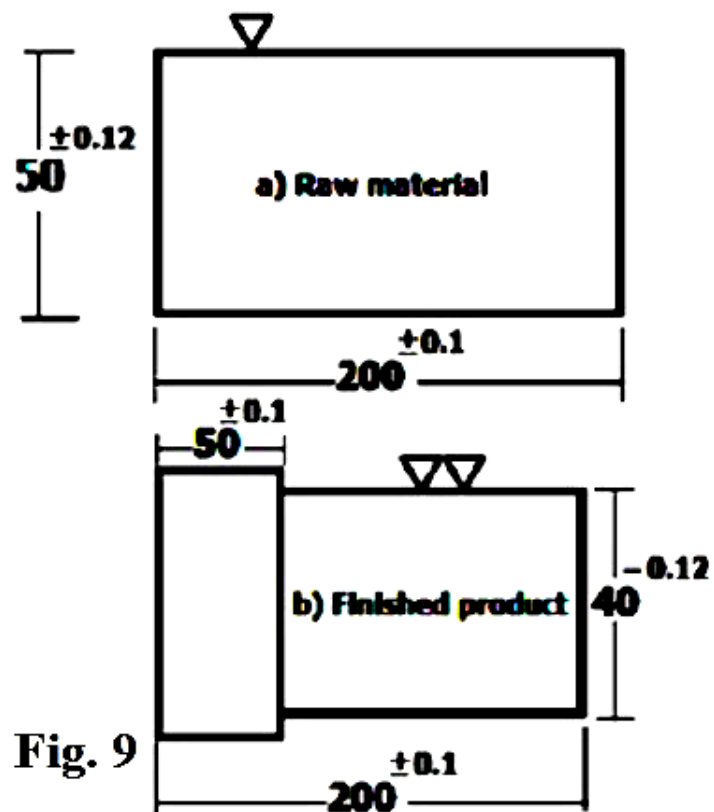
**Q3- B:** A 50mm diameter carbon steel rod, as raw material, is being reduced by turning on a lathe as shown in Fig. 6 , the tool is carbide . Find the following: (15 marks)

- (1) Optimal operating conditions; cutting speed, feed and depth from table 1.
- (2) The revolutions of spindle (RPM).
- (3) The material removal rate.
- (4) The required power of turning machine. (specific power =  $5 \text{ w.s/mm}^3$ )
- (5) The cutting force due to operation.





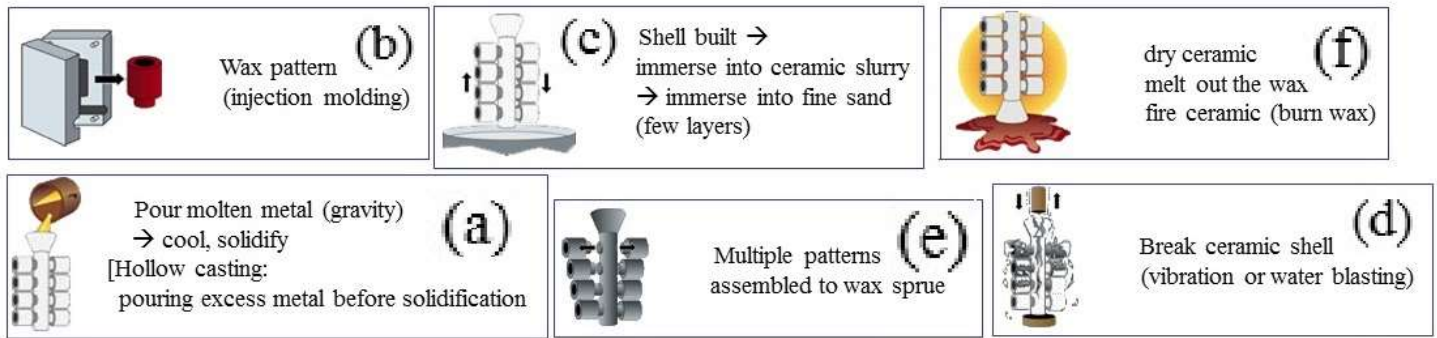
**Fig. 8**



**Fig. 9**

Q5-C: Operations of Investment casting (precision casting) as shown in following Figure, but with wrong sequences. Write number of the expression and State TRUE or FALSE.

(6marks)



1- b → c → d → e → f → a T OR F

2- b → a → f → e → d → c T OR F

3- b → e → c → f → a → d T OR F

4- d → a → e → b → f → c T OR F

5- a → b → c → d → e → f T OR F

6- c → d → a → b → f → e T OR F

**Table1:** Roughness ,Tolerance and Operating conditions

Ra micrometer μ m	Roughness Grade Numbers	Operation (Technical method)	Tolerance mm		Operating conditions		
			≤10mm	>10mm	depth mm	feed (mm/rev.)	speed (m/min)
> 70	~	Casting, Forging, sawing, flam cut.	± 0.5	± 1.0	3	0.3	50
>50		Precision casting	± 0.3	± 0.7			
50 25 12.5 6.3 3.2 1.6 0.8 0.4 0.2	▽	Roughing (milling, turning , drilling)	± 0.1	± 0.2	1	0.1	100
	▽▽	Finishing (milling, turning , drilling)	±0.07	± 0.1	0.2	0.05	130
	▽▽▽	Grinding, Honing Broaching	± 0.01	± 0.02			

**NOTE :** This virtual table is valid for this exam only For LOW CARBON STEEL and Operating conditions for milling, turning, drilling useful for carbide tool