

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), Nov.-Dec. 2015

B. Tech in Mechanical Engineering, Semester V

Roll No.....

ME508: MACHINING, MACHINE TOOLS &
METROLOGY

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A	Objective type multiple choice questions (10 questions @ 1 mark)	10
i.	The steel cutting tool material should contain: (a) Zero amount of carbon (b) around 1% or more carbon (c) carbon amount does not matter (d) high amount of chromium	
ii.	Cutting tools generally fail by: (a) mechanical breakage (b) plastic deformation (c) gradual wear (d) all of these	
iii.	To prevent tool failure at the cutting edge, the tool material should possess: (a) high fracture toughness (b) adhesion resistance (c) chemical stability (d) all of these	
iv.	Which is not a part of a planer machine? (a) work table (b) cross rail (c) column (d) feed lever	
v.	The economics of machining depends on: (a) machining time (b) tool life (c) tool changing time (d) all of the above	
vi.	Planer is used primarily for producing: (a) horizontal flat surfaces (b) horizontal curved surfaces (c) round surfaces (d) triangular surfaces	
vii.	Which tool measures surface roughness: (a) profilometer (b) vernier caliper (c) micrometer (d) None of these	
viii.	The method which does not vary the speed of a lathe spindle: (a) variable speed motor (b) all gear drive (c) belt drive on the cone pulley (d) gear for feed motion	
ix.	Stereo lithography is a: (a) removal process (b) regenerative process (c) forming process (d) joining process	
x.	Which is not a removal process: (a) Turning (b) grinding (c) extrusion (d) threading	
Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
i.	List four basic functions of machine tools?	
ii.	Name the few joining manufacturing processes?	
iii.	What are regenerative manufacturing processes, give examples?	
iv.	List the four major parts of a center lathe machine.	

Q.3A	Make a schematic diagram of a shaper machine and label its major parts.	05
Q.3B	Make a schematic diagram of a milling machine and label its major parts.	05
Q.4A	List the major differences between a shaper and a planing machine.	05
Q.4B	List the various costs associated in computation of the cost of machining operations?	05
Q.5A	How build up edge is formed, explain with the help of a suitable sketch?	05
Q.5B	With the help of graphs, explain the dependence of the size of the built up edge with the cutting velocity.	05
Q.6A	Explain with the help of a schematic diagram, various sources of heat generation in machining.	05
Q.6B	List the possible detrimental effects of high cutting temperature on the cutting tool and the job to be machined.	05
OR		
Q.6B	Why is it important to determine the cutting temperature and how is it determined experimentally?	05
Q.7A	List the various machining parameters that affect the cutting temperature.	05
Q.7B	What is the least count of a measuring instrument? How is it measured for a Vernier caliper, explain.	05
OR		
Q.7B	List the common mechanisms of cutting tool wear.	05
Q.8A	List the specifications of a center lathe and a shaper machine.	10
Q.9A	What are the measurement methods for tool wear? Show with the help of set of graphs the effect of machining time and cutting speed on the tool life.	10
Q.9B	If in turning of a steel rod by a given cutting tool (material and geometry) at a given machining condition (s_0 and t) under a given environment (cutting fluid application), the tool life decreases from 80 min to 20 min. due to increase in cutting velocity, V_C from 60 m/min to 120 m/min., then at what cutting velocity the life of that tool under the same condition and environment will be 40 min.?	10
OR		
Q.9B	While drilling holes in steel plate by a 20 mm diameter HSS drill at a given feed, the tool life decreased from 40 min. to 24 min. when speed was raised from 250 rpm to 320 rpm. At what speed (rpm) the life of that drill under the same condition would be 30 min.?	10