Code No: 115EE **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November - 2015
MACHINE TOOLS
(Common to ME, MCT, MSNT)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A (25 Marks)

1.a)	Discuss the variables affecting tool life.	[2]
b)	Explain requirement of tool materials?	[3]
c)	Discuss about attachment of lathe.	[2]
d)	What are the main parts capstan and turret lathes?	[3]
e)	List out the types of boring machine.	[2]
f)	List the advantages of shapers.	[3]
g)	Describe a 'milling cutter'.	[2]
h)	Define honing process.	[3]
i)	What is the difference between rough grinding and precision grinding?	[2]
j)	Define grinding operation.	[3]

PART - B (50 Marks)

2.a)	Describe basic requirements of machining.	
b)	Explain the construction of merchant force diagram.	[5+5]
	OR	
3.a)	List out various tool materials and explain their applications.	
b)	Explain the use of chip breakers in metal cutting.	[5+5]
4.a)	Explain the principal features of automatic lathes.	
b)	Discuss about the thread turning attachment on lathe.	[5+5]
	OR	
5.a)	Differentiate between single spindle and multi spindle automatic lathes.	
b)	Discuss the working of various tool holding devices of lathe.	[5+5]
6.a)	Explain various operations performed in drilling machine.	
b)	Sketch and explain the working of hydraulic drive of a horizontal shaper.	[5+5]
	OR	
7.a)	What is the planner? Illustrate and describe its working principle.	
b)	Explain operation of vertical boring machine.	[5+5]
8.a)	Sketch and describe a vertical milling machine.	
b)	List the product applications of lapping process.	[5+5]
	OR	
9.a)	With the help of a neat diagram, explain the honing process.	
b)	Explain the factors to be considered while selecting a milling cutter.	[5+5]

10.a) Sketch and explain the three methods of external cylindrical centre less grinding.
b) Explain different types of abrasives used in grinding wheel. [5+5]

OR

11.a) Differentiate between traverse and plunge grinding.
b) Explain with neat sketch
i) Centre less grinding ii) Internal grinding [4+6]

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Code No: 115EE **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November/December - 2016
MACHINE TOOLS
(Common to ME, MCT, MSNT)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	What is the function of chip breaker?	[2]
b)	Define the terms 'Cutting speed', 'feed' and 'depth of cut'?	[3]
c)	What is an apron?	[2]
d)	What are the attachments are used commonly on capstan and turret lathes?	[3]
e)	What are the common work holding devices used in shaper?	[2]
f)	Distinguish between Drilling and tapping?	[3]
g)	What is honing?	[2]
h)	Define Broaching?	[3]
i)	Why a coolant used in grinding work?	[2]
j)	What do you mean by dressing and truing in grinding wheel?	[3]

PART - B

(50 Marks)

2. Draw a Merchants circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool and different parameters involved in metal cutting. [10]

OR

3.a) Derive the expression for shear angle in orthogonal cutting in terms of rake angle and chip thickness ratio.
b) How is the chip formed in metal cutting? Explain the terms Shear plane and Shear Zone. [5+5]

4.a) What machining operations can be performed on a center lathe?
b) How do you classify turret lathes? Give a brief description of the different types you know. [5+5]

OR

5.a) What is face plate? Where will you prefer its use and why?
b) Explain the construction and working principle of a lathe with neat sketch. [5+5]

6.a) Explain the working of a hydraulic quick return mechanism of a shaper.
b) Explain various operations performed in drilling machine. [5+5]

OR

7.a) Explain the working of a slotted disc mechanism for driving the ram of a slotter.
b) Differentiate between shaping, planning and slotting, as regards relative tool and work motions. [5+5]

8.a) Describe in detail about honing tools.
b) What is the principle of working of milling machines? How do you classify the milling machine? [5+5]

OR

9.a) Explain the difference between lapping and grinding.
b) With the help of a line diagram, explain the constructional features of a universal milling machine. [5+5]

10.a) How the grinding wheel is selected for a particular job?
b) Which materials are used in the manufacture of grinding wheels? What properties they impart to the wheel? [5+5]

OR

11.a) What are common devices used for dressing of grinding wheels? Describe in brief.
b) What are the advantages and disadvantages of the different bonds used in grinding wheel? [5+5]

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R13

Code No: 115EE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November/December - 2017
MACHINE TOOLS
(Common to MSNT, ME, MCT)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	Describe the basic elements of machining.	[2]
b)	How does a build up edge is formed? Explain its effects.	[3]
c)	What is a Lathe what are the types of Lathe.	[2]
d)	List out various types of Lathe attachment explain any one.	[3]
e)	Classify different types of Drilling machines.	[2]
f)	Explain the working principle of slotter.	[3]
g)	Explain the principle of milling machine.	[2]
h)	Write about various advantage and limitations of honing and lapping.	[3]
i)	How are abrasives selected for grinding operation?	[2]
j)	Compare and contrast grinding, lapping and honing.	[3]

PART - B

(50 Marks)

2.a) Derive the expression for chip thickness ratio.
b) Determine the cutting speed and machining time per cut when the work piece having 45 mm diameter is rotating at 400 rpm. The feed given as 0.15 mm/rev and length of cut 6cm. [5+5]

OR

3.a) In orthogonal cutting of mid steel component, if the rake angle of the cutting tool is 12^0 and the shear angle is 42^0. Find the chip thickness ratio.
b) What are the desirable Characteristics of cutting material? Describe them in brief. [5+5]

4.a) Draw the tool layout of Hexagonal head bolt.
b) Diagrammatically explain the thread cutting on the lathe machine. [5+5]

OR

5.a) How lathe is specified explain briefly the operations that are performed on a lathe.
b) Explain what is meant by a Taper. Discuss in detail the taper turning by compound rest swelling method? [5+5]

6.a) Describe the operation of quick return motion in mechanical Shaper.

b) Find the machining time required for machining the surface 600 × 800 mm, on a shaping machine. Assume, cutting speed as 8 m/min. The return to cutting time ratio is 1:4, and the feed is 2 mm/ stroke. The approach and overrun at each end is 70 mm. [5+5]

OR

7.a) With the help of neat sketch explain the radial drilling machine.

b) Estimate the time required to drill a hole on a wider face of a give workpiece of size 2m × 1m × 50mm.Assuming the cutting angle as 230 degrees, approach and overrun be 30 mm each, cutting velocity 52m/min, feed be 2mm/stroke and clearance on both side be 20mm. [5+5]

8.a) Differentiate between up milling and down milling and explain their applications.

b) Explain in detail various operations performed on milling machine. [5+5]

OR

9.a) Explain the procedure for simple indexing with an example.

b) With the help of neat sketch explain the geometry of milling cutter. [5+5]

10.a) What are surface grinding machine, explain various surface grinding machines.

b) Describe grinding wheel structure with a neat sketch. [5+5]

OR

11.a) What are special types of grinding machine explain two in detail.

b) What is meant by centerless grinding? State its advantages and limitation of it. [5+5]

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Code No: 135BE **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, December - 2019
METROLOGY AND MACHINE TOOLS
(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) Explain the conditions favoring the use of negative back rake angle on a single point cutting tool. [2]
b) Differentiate between capstan and turret lathe. [3]
c) Give the specification of boring machine. [2]
d) Explain how to and fro motion is imparted to the ram in shaper. [3]
e) Write about the materials used for broaching tools [2]
f) Define lapping? Compare lapping with honing and grinding. [3]
g) Explain the need for the use of tolerance. [2]
h) Differentiate between hole basis and shaft basis system [3]
i) Differentiate between roughness and waviness. [2]
j) List out the applications of CMMs. [3]

PART – B

(50 Marks)

2.a) Explain the geometry of chip formation with proper sketches and equations.
b) What is an automatic machine? State the factors, which effect the classification of automatic machines. [5+5]

OR

3.a) Briefly discuss about Geometry of single point cutting tool? Also, explain the following i) rake angle ii) Clearance angle iii) cutting angle iv) lip angle, with neat sketch.
b) Briefly discuss about the different type of taper turning methods with sketches. [5+5]

4.a) Differentiate among shaping, planning and slotting machines.
b) What is a jig-boring machine? Describe its construction and working in detail with a neat sketch. [5+5]

OR

5.a) A C.I. plate measuring 300mm × 100mm × 40mm is to be rough shaped along its wider face. Calculate the machining time taking approach = 25mm, over travel = 25mm, cutting speed = 12m/min, return speed = 20m/min, allowance on either side of the plate width = 5mm and feed per cycle = 1mm.
b) Explain in detail with neat sketches horizontal type of boring machines. [5+5]

6.a) What is indexing? Explain some common methods of indexing in milling machines.

b) Calculate the grinding force in surface grinding operation using grinding wheel of 250mm diameter, rotating at 2500rpm. The work piece is of mild steel having width of 20mm. depth of cut = 0.05mm and feed velocity of table = 2mm/sec. Assume the no of grits/mm^2=3mm. Take value of specific energy for mild steel = 1.4J/mm^2. [5+5]

OR

7.a) Sketch and explain the working of plain column and knee type milling machine.

b) What are the various factors to be considered in selection of grinding wheel? Discuss each in detail. [5+5]

8.a) Explain the use of sine bar for setting a component for a given angle.

b) Compare and contrast unilateral and bilateral tolerance system. [5+5]

OR

9. A hole and shaft system had the following dimensions:
60 H 8 /c 8
The multiplier of grade 8 is 25.
The fundamental deviation for 'C' shaft is – (9.5 + 0.8 D).
The diameter slip is 50 – 80.
Design the suitable 'GO' and 'NO-GO' gauges for shaft and hole. [10]

10.a) The heights of peak and valleys of 20 Successive points on a surface are 35, 25, 40, 22, 37, 19, 41, 21, 42, 18, 42, 24, 44, 25, 40, 18, 40, 18, 39, 21 microns respectively, measured over a length of 20mm. Determine CLA and RMS values of roughness surface.

b) Explain various alignment tests to be conducted on milling machine. [5+5]

OR

11.a) What is a drunken thread? Explain in detail.

b) Suggest and explain a method to check the root thickness of gear teeth. [5+5]

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R16

Code No: 135BE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November/December - 2018
METROLOGY AND MACHINE TOOLS
(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	What are the different types of Chips	[2]
b)	How can tool rake angle and clearance angle defined?	[3]
c)	Describe the Portable drilling machine and its applications.	[2]
d)	Discuss the characteristics of planer machined parts.	[3]
e)	What are the basic functions of milling?	[2]
f)	What are the applications of broaching machines?	[3]
g)	What are types of fits?	[2]
h)	Discuss about the Bevel protractor. Where it is used?	[3]
i)	Describe the importance of surface roughness?	[2]
j)	What is Coordinate measuring machine?	[3]

PART - B

(50 Marks)

2.a) Describe the turning process in lathes.
b) Explain the working of a multi spindle lathes and its applications. [5+5]

OR

3.a) Differentiate between Capstan and Turret lathe.
b) What are the different attachments used in lathe machine? Explain any two attachments? [5+5]

4.a) Explain the working of radial drilling machine with a sketch.
b) What are the different types of drill are used? Describe any one of the drill bits. [5+5]

OR

5.a) Show and describe the various machining applications of slotting machines.
b) Explain the working of planning machine with a sketch. [5+5]

6.a) Describe briefly the method of estimation of the required for producing all the teeth of a spur gear in a gear hobbing machine.
b) Explain the methods of indexing applicable in milling machine and its limitations. [5+5]

OR

7.a) Explain the geometry of milling cutters with sketches.
b) What are the types of abrasives? Explain anyone of it. [5+5]

8.a) Explain the Taylor's principle applied in limits.
b) Explain the principle of optical flat and auto collimator. [5+5]

OR

9.a) Describe the measuring method by using sine bar.
b) Explain Hole basis system and shaft basis system. [5+5]

10.a) What are the types and applications of CMM?
b) Describe the screw thread measurement with sketch. [5+5]

OR

11.a) Explain the machine tool alignment test on drilling machine.
b) Explain the Roughness parameters and Roughness profiles. [5+5]

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