

Total No of Questions: [12]

SEAT NO. :

[Total No. of Pages :2]

S.E. Mechanical Examination 2014
(Production Technology) (202052)
2008 course(Sem II)

Time: 3 Hours

Max. Marks : 100

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate answer books.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Use of Calculator is allowed.
- 5) Assume Suitable data if necessary

SECTION I

- Q1) a) Explain Merchant's force circle diagram. [6]
b) The following data was collected from an orthogonal machine test [12]
on steel :
Uncut Chip thickness = 0.127 mm
Chip thickness = 0.228 mm
Rake angle = 10°
Cutting speed = 2 m/s
Width of cut = 6.35 mm
Cutting force = 600 N and Thrust force is 250 N.
Calculate shear angle, friction angle, shear stress along shear plane and the power for the cutting operation, chip velocity and shear strain in chip.

OR

- Q2) a) What are the types of chip formation? Explain. [6]
b) What is Tool Life ? Explain the relation between Tool Life and Cutting Speed. [6]
c) The tool life equation for machining C-40 steel by using HSS tool is given by [6]
 $VT_n = C$.
The cutting speed and Tool life data is given as below

V, m/min	25	35
T, min	90	20

 - i. Calculate n and C
 - ii. Recommend cutting speed for tool life of 60 minutes.

Q3) a) Explain the Gear shaping and hobbing process. [10]
b) Explain broaching tool with neat sketch. [6]

OR

- Q4) a) Explain thread rolling process with neat sketches and its advantages. [8]
b) Explain gear generation on milling machine. [8]
Q5) a) Classify NC machines. [8]
b) Explain CNC machine with sketch, explain features of CNC machines compared to NC machines [8]

OR

- Q6) a) Explain machining center with neat sketch. [8]
b) Explain the following G and M codes with their format [8]
G03, G00, M03 and M06

SECTION II

- Q7) a) Differentiate between blanking and piercing operation. [8]
b) Compare simple, compound and combination die with neat sketch [10]

OR

- Q8) a) Calculate the bending force for a 45° bend in an aluminium blank. The following [6]
data is given
Blank thickness = 1.6 mm
Bend length = 1.2 m
Die opening = 8 * metal thickness
Ultimate tensile strength = 455 N / mm²
b) Explain stripper in blanking operations. [6]
c) Sketch different types of pilots in press tools. [6]
Q9) a) Classify various non conventional machining processes. [6]
b) Explain AJM process with its advantages limitations and applications. [10]

OR

- Q10) a) Explain Laser beam machining with neat sketch. [8]
b) Explain Plasma arc machining with neat sketch. [8]
Q11) a) Explain 3-2-1 principle with neat sketch. [6]
b) Explain different types of bushes used in drilling with neat sketch. [10]

OR

- Q12) a) What are the difference between Jigs and fixtures. [6]
b) Explain indexing mechanism in Jigs and fixtures with example and sketch. [10]