Registration No.: | | | | | | | | | | |

Total Number of Pages: 02 **Course: IDD (B.Tech and M.Tech)**
Sub_Code: RME6C002

6th Semester Regular/Back Examination: 2024-25
SUBJECT: Machining Science and Technology
BRANCH(S): Mechanical Engineering
Time: 3 Hours
Max Marks: 100
Q.Code: S208

Answer Question No.1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) What is pure orthogonal turning?
b) Show all the tool signature of ORS system.
c) How Surface Roughness is measured?
d) What are the types of wears formed during a turning process?
e) What is Degree of Freedom (DOF)? What is its value in taper turning?
f) State suitable machining parameters for forming brittle chips.
g) Explain Faraday's two laws.
h) State two machining processes where quick return mechanism is used.
i) A hole is to be made on a ceramic plate. What are the machining processes used?
j) Define LASER.

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) A steel rod is turned in a lathe by a tool of geometry –6°, 5°, 6°, 7°, 10°, 75°, 1.2 mm. Show all the angles in proper planes in ASA system.
b) Show the terms Ra, Rz, Rmax., Waviness of a surface roughness measurement system.
c) Show the possible speed transmission mechanism from motor to spindle of a lathe.
d) The value of tool life decreased from 160 minutes to 40 minutes due to increase in cutting velocity from 160 m/min. to 320 m/min. in turning low carbon steel. Find the constant and index.
e) Show the Merchant circle diagram with all the forces and angles.
f) Compare the appropriate Flank Wear, Crater Wear for machining of medium carbon steel with a Velocity of 200 m/min., feed 0.5 mm/rev. and depth of cut 0.5 mm after machining for 2 minutes, 5 minutes respectively for a length of 400 mm.
g) Show the velocity vector diagram among (Cutting Velocity) Vc, (Feed Velocity) Vf, and (Shear Velocity) Vs.
h) Show a complete set of fixture and jig with drawings for a milling operation.

i) What are the basic differences among Conventional, Semi-automatic, and Automatic lathe?
j) State Machinability and Economics of Machining with few examples.
k) What are the types of pulse generated in an EDM process? Show with neat sketches.
l) Show all the parts of an LBM process.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four) **(16 x 2)**

Q3 Show all the angles of an ORS and ASA systems. Compare with drawings. **(16)**

Q4 Compare Gear Milling and Gear Hobbing process by sketches. **(16)**

Q5 Define ECM and EDM process and compare all the features with suitable sketches. **(16)**

Q6 How materials are removed by an AJM and USM processes? Compare the advantages and disadvantages with sketches. **(16)**