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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)

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

Part-II

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

- A steel rod is turned in a lathe by a tool of geometry $-6^\circ, 5^\circ, 6^\circ, 7^\circ, 10^\circ, 75^\circ, 1.2$ mm. Show all the angles in proper planes in ASA system.
- Show the terms Ra, Rz, Rmax., Waviness of a surface roughness measurement system.
- Show the possible speed transmission mechanism from motor to spindle of a lathe.
- 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.
- Show the Merchant circle diagram with all the forces and angles.
- 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.
- Show the velocity vector diagram among (Cutting Velocity) V_c , (Feed Velocity) V_f , and (Shear Velocity) V_s .
- 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)**