Registration no:

5ᵗʰ Semester Regular / Back Examination 2015-16
MACHINING SCIENCE & TECHNOLOGY
BRANCH: MECHANICAL
Time: 3 Hours
Max Marks: 70
Q.CODE: T502
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:**   **(2 x 10)**
  a) What are the process parameters used during machining?
  b) What is the basic difference between shaping and planning?
  c) A steel bar 200 mm in diameter is turned at a feed of 0.25mm/rev with a depth of cut of 4 mm. The rotational speed of the work piece is 160 rpm. Find out the material removal rate in mm³/s.
  d) In a machining operation, doubling the cutting speed reduces the tool life to 1/8ᵗʰ of the original value. Find out the exponent n in Taylor's tool life equation.
  e) What are the basic requirements of an ideal dielectric fluid?
  f) Draw a graph for velocity of water flow verses tip distance of the nozzle from the work piece in case of water jet machining.
  g) State the parameters of tool and work piece responsible for formation of continuous chip with built up edge(BUE).
  h) What similarity & dissimilarity found between Honing and lapping operation?
  i) Name three materials used as shaped tool in Electrochemical machining.
  j) Discuss briefly about glazing of a grinding wheel.

Q2 a) In an orthogonal cutting test, the following observations were made   **(7)**
Cutting force= 1200 N
Thrust force=500 N
Tool rake angle=zero
Cutting speed=1 m/s
Depth of cut=0.8 mm
Chip thickness=1.5 mm
Calculate(a)Friction angle during machining.(b)Chip speed along tool rake face.
  b) What is the basic difference between up milling and down milling? Compare with the help of diagrams.   **(3)**

Q3 **a)** What are the negative effects of high cutting temperature on the machined product and the cutting tool? **(5)**

b) What are the primary functions of a cutting fluid? **(5)**

Q4 What is the principle of metal removal in EDM process? Describe the process with the help of sketch. List the advantages and limitations of the system. **(10)**

Q5 **a)** In an electrochemical machining process with a pure iron workpiece, a removal rate of 5cm^3/min is desired. Determine the current required. (Atomic weight of iron=56g, density=7.8g/cm^3) **(5)**

b) What is the significance of Capstan, Turret & Automatic lathe in production shop? **(5)**

Q6 Thickness of a rectangular brass plate of length L_w and width B_w has to be reduced t mm in one pass by a slab milling cutter of length l_c ($>B_w$), diameter D_c and number of teeth, Z_c at cutting velocity, V_c m/min and feed,S_0 mm/tooth. Determine time required to accomplish the work ? **(10)**

Q7 **a)** What are the different indexing methods used in Milling? Explain in detail. **(5)**

b) What are the different methods of Grinding? Specify the Grinding wheel. **(5)**

Q8 **Write short notes on any two:** **(5 x 2)**
  a) Lathe Tool dynamometer.
  b) Cemented carbide tools.
  c) Surface grinding.
  d) Maximum profit criteria in economics of machining.