[4758]-520

T.E. (Mechanical Engg.)

MANUFACTURING PROCESS - II

(2012 Course) (Semester - II) (End - Sem.) (302051)

Time : 2½ Hours]

[Max. Marks :70

Instructions to the candidates:

1) *Solve Q.No.1 or 2, Q.No.3 or 4, Q.No.5 or 6, Q.No.7 or 8, Q.No.9 or 10.*
2) *Figures to the right indicate full marks.*
3) *Use of electronic pocket calculator is allowed.*
4) *Assume suitable data, if necessary.*

Q1) a) Explain lapping process with neat sketch. **[6]**

b) A plain surface 60 mm wide and 230 mm long is to be milled on a horizontal milling machine with cutter diameter 80 mm and speed 50 m/min. Take feed per tooth is 0.11 mm and number of teeth on cutter = 12. Calculate machining cutter. **[6]**

OR

Q2) a) Draw figure of any four grinding wheel shapes used, with its names. **[6]**

b) Draw and explain broach tool geometry. **[6]**

Q3) a) A 250 mm diameter bar is turned at 40 rev/min. with depth of cut of 2 mm and feed of 0.3 mm/rev. Calculate Power consumption and specific cutting energy with cutting force 1500 N and Feed force 400 N. **[4]**

b) Explain economics of machining in metal cutting. **[4]**

OR

**Q4)** a) Draw neat sketch of single point cutting tool geometry. **[4]**

b) Define built up edge. With neat sketch explain formation of BUE. **[4]**

Q5) a) Explain LBM process with its adv., limitations and applications. **[8]**

b) Compare the ECM and USM with various process parameters. **[8]**

OR

Q6) a) Draw a Schematic diagram of 'Electro-discharge Machining' and explain its working principle and process parameters. **[8]**

b) Explain AJM process with its advantages, limitations and applications.**[8]**

Q7) a) Explain CNC machines with neat sketch. State its advantages and limitations. **[6]**

b) Differentiate between subroutine and canned cycle. **[4]**

c) Write a CNC program for manufacturing component shown in fig. from a 100 mm long cylindrical component of 80 mm dia. **[6]**
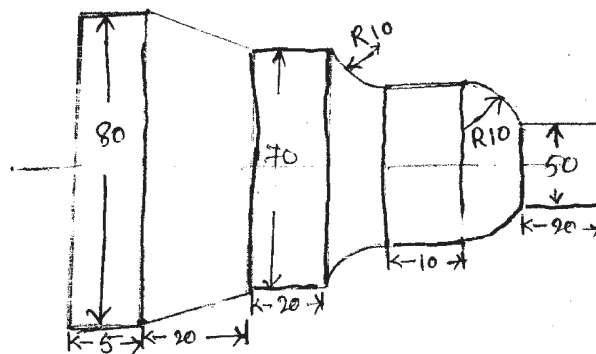
OR

Q8) a) Write short notes on the following: **[8]**

i) Machining Center.

ii) Automatic tool changer (ATC)

b) Differentiate between absolute and incremental positioning system in CNC. **[4]**

c) Explain the following codes G02, M06, G04, M09. **[4]**

Q9) a) What is 3-2-1 location principle? Explain with the help of neat sketches.**[6]**

b) What are the different types of jigs? Explain any one with suitable sketch.
[4]

c) Design and draw drilling jig for drilling the two 10 mm dia. holes in the component shown in fig. (a) **[8]**

OR

Q10) a) List various types of clamping devices used in jig and fixtures. Explain any one in detail. **[6]**

b) Explain concept of Poka Yoke in jig and fixture. **[4]**

c) Design and draw milling fixture for milling slot of 10 mm wide, 5 mm deep and 20 mm in length for the component shown in fig. (a) **[8]**

fig.(a)

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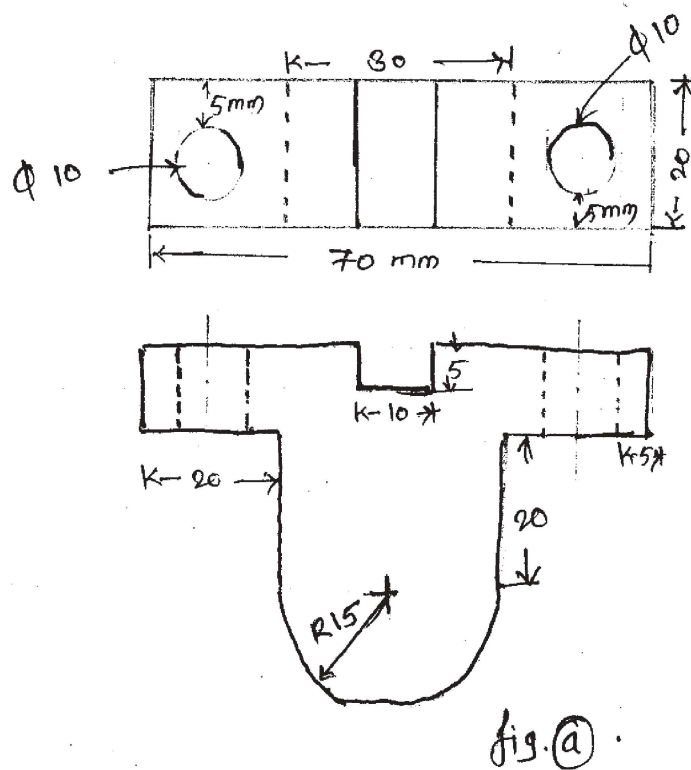
[4758] - 521
T.E. (Mechanical S/W)
MACHINE DESIGN
(2012 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

1) All questions are compulsory.

2) Neat diagrams must be drawn wherever necessary.

3) A figure to the right indicates full marks.

4) Use of logarithmic tables & electronic pocket calculator is allowed.

5) Assume suitable data, if necessary.

UNIT - 1 & 2

Q1) a) A belt pulley is keyed to the shaft midway between the supporting bearing kept at 1000mm apart. The shaft transmits 20 Kw power at 400 rpm. The pulley has 400 mm diameter. The angle of wrap of belt on pulley is 180° and belt tension acts vertically downwards. The ratio of belt tension is 2.5. The shaft is made of steel (s_{ut} = 400N/mm², S_{yt} = 240N/mm²). The combined shock and fatigue factors in bending and torsion are 1.5 and 1.25 resp. The permissible lateral deflection is 1mm/m length. Determine shaft diameter on basis of

   i)   Strength   ii)   Lateral rigidity   **[7]**

b) State and Explain condition for self locking and over hauling of power screw.**[3]**

OR

Q2) The following data refers to a C-clamp with single start square threaded screw.**[10]**

● Maximum force exerted by the clamp = 4 KN.

● Tensile yield strength for screw material (50C4) = 390 N/mm².

● Yield strength in shear for nut and body material (FG 200) = 230 N/mm²

● Permissible bearing pressure = 12 N/mm².

● Coefficient of screw friction = 0.14.

● Coefficient of collar friction = 0.16.