Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (2011 Onwards) (Sem.–4)

MANUFACTURING PROCESS – II

Subject Code : BTME-405

Paper ID : [A1215]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Q1. Write briefly :

a) Differentiate between hot working and cold working of metals. Bring out the advantages and disadvantages of each of these techniques.

b) What is elastic recovery or spring back?

c) Write the formula to calculate the cutting forces in shearing operation.

d) What are the effect of forging on porosity and segregation?

e) Enumerate the essential requirements of tool materials.

f) List the essential requirement of cutting fluids.

g) Give the constituents of ceramics. How these materials are produced?

h) What are the advantages and disadvantages of pull and push broaches?

i) Explain the concept of orthogonal and oblique cutting with suitable sketch.

j) Name the factors that contribute to the formation of discontinuous chips.

SECTION-B

Q2. State and explain the working of "universal rolling mill" and "planetary rolling mill".

Q3. List the various tool materials used in industry. State the advantages and disadvantages of each material.

Q4. What is machining time? Find the time required for one complete cut on a piece of work 350 mm long and 50 mm in diameter. Cutting speed is 35m/min and feed is 0.5 mm/rev.

Q5. Explain with suitable diagram the quick return mechanism used in shaping machines.

Q6. Draw a Figure showing all the details of a single point cutting tool and elaborates the various cutting angles.

SECTION-C

Q7. A 5 mm thick aluminium alloy strip is rolled to a thickness of 4 mm, using steel roller of radius 100 mm. The tensile yield strength of aluminium is 0.28kN/mm^2.

Determine

i) The minimum coefficient of friction μ_{min} between the workpiece and the rolls for an unaided bite to be possible.

ii) The angle subtended by the contact zone at the roll centre.

iii) The location of the neutral point with $\mu = \mu_{min}$.

Q8. The cutting and thrust force components of the machining force during orthogonal machining of aluminium with a rake angle of 10° are found to be 312 N and 185 N, respectively.

i) Estimate the coefficient of friction between the tool and tip.

ii) If the rake angle reduced to zero, keeping all the other parameters the same, and if coefficient of friction also remains unchanged, estimate the new values of F_c and F_T, using Merchant's first solution.

Q9. Write notes on :

i) Selection of machining parameters.

ii) Progressive and combination die.