PAPER ID-310915

Subject Code: RME503

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM V) THEORY EXAMINATION 2023-24
MANUFACTURING SCIENCE & TECHNOLOGY-II

TIME: 3 HRS **M.MARKS: 70**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	Define rake angle.
b.	Describe different types of chips formed during machining.
c.	Explain knurling operation.
d.	What is the difference between capstan and turret lathe.
e.	Define spot welding.
f.	Write down the names of different abrasive used in grinding wheel.
g.	What are the advantages and disadvantages of ECM over conventional drilling?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	Draw and explain the various forces on merchant force circle diagram.
b.	How is a lathe specified? Explain with a neat sketch the relevance of each of the specification points.
c.	What is super finishing? Explain the honing process in detail with neat sketch.
d.	Describe the oxy-acetylene welding process with neat sketch. Explain the different types of flame and its applications used in gas welding.
e.	Explain the principle and working of electro chemical machining (ECM) with suitable sketch.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a)	The following data from the orthogonal cutting test is available. Rake angle=10, chip thickness ratio=0.35, uncut chip thickness= 0.51mm, width of cut= 3 mm, yield shear stress of work material= 285 N/mm^2, mean friction co-efficient on tool face= 0.65, Determine **(a)** Cutting Force (Fc) **(b)** Radial Force **(c)** Normal Force (N) **(d)** Shear Force (Fs).
(b)	What do you understand by tool life? In an orthogonal machining operation, the tool life obtained is 10 min at a cutting speed of 100 m/min while at 75 m/min cutting speed, the tool life is 30 min. Find the value of index (n) in the Taylor's tool life equation.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Differentiate between up milling and down milling with neat sketch.
(b)	A hole with 40 mm diameter and 50mm depth is to be drilled in mild steel component. The cutting speed can be taken as 65 m/min and feed rate as 0.25mm/rev. Calculate the machining time and the material removal rate.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Explain grinding wheel specifications and its individual elements of the marking system from the standpoint of the functioning of the grinding wheel.
(b)	Explain the concept of clearance, interference, and transition fits. Give examples where these can be applied.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Give the classification of welding processes. Describe the arc welding process in detail using suitable diagrams. What is the difference between DCSP and DCRP?

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(b)	Two steel sheet of 1mm thickness are resistance welded in a lap joint with a current of 10,000 Amp for a 0.1 second. The effective resistance of joint is 100 micro ohms. The joint can be considered as a cylinder of 5mm diameter and 1.5 mm height. Calculate heat loss to the surrounding if heat required to the melt steel is 10 J/mm^3.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What is Abrasive Jet Machining (AJM)? Explain the working process with suitable diagram. Also explain the effect of nozzle tip distance and abrasive mass flow rate on material removal rate in the AJM.
(b)	Explain electro discharge machining (EDM) process with the help of neat sketch. What are the parameters that control the material removal rate in EDM? Name any three important electrode materials used in EDM.