 Sub Code:EME503

Paper Id: 140514 **Roll No:** | | | | | | | | | | | | | |

B. TECH
(SEM-V) THEORY EXAMINATION 2019-20
MANUFACTURING SCIENCE-II

Time: 3 Hours ***Total Marks: 100***

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

SECTION A

1. Attempt *all* questions in brief. 2 x10 = 20

a) Differentiate between crater and flank wear.
b) What is interchangeability?
c) What do you mean by non- traditional machining process?
d) Differentiate between cutting speed and feed?
e) What is machinability? List the factors that affect machinability.
f) Differentiate between counter boring and counter sinking.
g) Define arc blow.
h) Define HAZ.
i) What are the functions of flux and filler rod?
j) Define dressing and truing.

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. Explain Merchant's force diagram and derive the merchant's shear angle relationships.
b. Explain with the help of neat sketch working principle of universal milling machine. Also explain different milling operation.
c. During a steady gas metal arc welding with direct current electrode positive polarity, the welding current, voltage and weld speed are 150 A, 30 V and 6 m/min, respectively. A metallic wire electrode of diameter 1.2 mm is being fed at a constant rate of 12 m/min. The density, specific heat and melting temperature of the wire electrode are 7000 kg/m3, 500 J/kg^{o}C and 1530°C, respectively Assume the ambient temperature to be 30 respectively. Assume the ambient temperature to be 30°C and neglect the latent heat of melting. Further, consider that two-third of the total electrical power is available for melting of the wire electrode. Calculate the melting efficiency (in percentage) of the wire electrode.
d. Write down the short notes on (a) lapping (b) buffing
e. Explain the working principle of electro-chemical machining process with the help of suitable diagram also derive the formula for material removal rate.

SECTION C

3. Attempt any one part (10x1=10)

a. In orthogonal turning of an engineering alloy, it has been observed that the friction force acting at the chip tool interface is 402.5 N and the friction force is also perpendicular to the cutting velocity vector. The feed velocity is negligibly small with respect to the cutting velocity. The ratio of friction force to normal force associated with the chip-tool interface is 1. The uncut chip thickness is 0.2 mm and the chip thickness is 0.4 mm. The cutting velocity is 2m/s. Assume that the energy expended during machining is completely converted to heat. Calculate the rate of heat generation (in W) at the primary shear plane.
b. Write down the Taylor's tool life equation also explain the different factor which affect the tool life.

4. Attempt any one part (10x1=10)

a. Explain working and construction of capstan lathe? How it differ from turret lathe
b. With the help of neat sketch explain working principle of radial drilling machine..

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5. Attempt any one part (10x1=10)

a. What do you mean by fit? Explain different types of Fit

b. What are the different finishing operations? Explain cntreless grinding.

6. Attempt any one part (10x1=10)

a. Explain the principle of arc welding .also explain TIG welding with applications and limitation.

b. Explain the principle of gas welding. Also explain different types of flame and their applications.

7. Attempt any one part (10x1=10)

a. Explain the working principle of plasma arc machining. Also write down their advantages and applications.

b. Derive the expression for the material removal rate of electro discharge machining. Also explain various types of circuit used in EDM.

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