

(Following Paper ID and Roll No. to be filled in your
Answer Book)

Paper ID : 140503

Roll No.

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B. Tech.

(SEM. V) THEORY EXAMINATION, 2015-16

MANUFACTURING SCIENCE & TECHNOLOGY-II

[Time:3 hours]

[Maximum Marks:100]

SECTION-A

Note : All questions are *compulsory*

1. Attempt **all** parts . All parts carry **equal** marks. Write answer of all part in short . (2x10=20)
 - (a) Describe the cutting tool temperature.
 - (b) Discuss the conditions due to which discontinuous chips produced in metal cutting.
 - (c) What are the carbide cutting tool materials and its applications ?
 - (d) What is an abrasive ? What are its types and characteristics ?
 - (e) Write short note on hybrid machining processes.

- (f) Bring out the differences between orthogonal and oblique cutting.
- (g) Differentiate between normal, oxidizing and carburizing flames.
- (h) Explain the mechanics of material removal in ECM process.
- (i) What is meant by brazing? How does it differ from soldering?
- (j) Why Schaeffler diagram is used?

SECTION-B

Note: Attempt any **five** questions from this section. (10x5=50)

- 2. What are the cutting fluids? Discuss various properties of cutting fluids used during machining.
- 3. What are the main differences between a shaper and planer? Discuss the different drive mechanisms used in shaper with the help of suitable diagram.
- 4. Explain three different ways in which the wear of grinding wheel takes place. What can be done to prevent them? Differentiate Dressing and Truing.
- 5. What are various types of arc welding power sources? Give the advantages and limitations of each.

- 6. Explain with neat sketches-Resistance welding & submerged arc welding.
- 7. How are grinding wheels specified? Clearly differentiate between grade and structure of a grinding wheel?
- 8. Define flaw, roughness and waviness to characterize surfaces. Show surface profile for a rough, lapped and finished object.
- 9. What is the purpose of reaming? Explain the process of Honing Lapping Cladding.

SECTION-C

Note: Attempt any **two** questions from this section. (15x2=30)

- 10. Discuss the various criteria used for optimizing the cutting conditions. A cylindrical bar is to be turned. The maximum allowable feed is 0.2mm/revolution and at this feed rate Taylor's tool life equation for a tool work combination is found to be $VT^{0.25} = 55$. The labor cost involved in each regrinding if the tool is Rs 7.0. On the average, it takes about 3 minutes to change the tool. Find the cutting speed that will lead to maximum production rate. Derive the formula used.
- 11. How are non-conventional machining processes different from conventional machining processes? Write brief notes on all of the following:

- (i) Abrasive jet machining (AJM)
- (ii) Advantages of EBM over USM
- (iii) Plasma arc welding

12. Draw Merchant's force circle diagram and develop expression for power required in metal cutting and derive Merchant's shear angle relationship.

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