MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL (A constituent unit of MAHE, Manipal)

I SEMESTER M.TECH (TRIBOLOGY & MAINTENANCE) END SEMESTER EXAMINATIONS, NOVEMBER 2018

SUBJECT: SURFACE ENGINEERING [MME 5164]

REVISED CREDIT SYSTEM

Instructions to Candidates:

Answer ALL the questions. 1A. Justify any four major applications of physical vapour deposition coating (4) technique. 1B. Write a note on measurement of thickness of a coating. (3) **1C.** Briefly explain the most important properties of the powders used in a thermal (3) spray process. 2A. (4) What are the possible failure modes of coatings? 2B. What are the factors to be considered for the selection of weld hardfacing (3) process? **2C.** Explain thermionically assisted triode ion plating process. (3) **3A.** With a relevant sketch illustrate the modes of film growth in a chemical (4) vapour deposition process. 3B. Write a note on relatively low-cost surface treatment commonly employed to (3) low-carbon and low-alloy steels to confer antiscuffing properties. **3C.** What are the advantages of laser surface engineering? (3) 4A. Using relevant sketch explain how a coating builds up in a thermal spray (4) process. 4B. Illustrate the key features of gold color coating through chemical vapour (3) deposition process. **4C.** What are the reasons for short cracks in surface coatings? (3) 5A. Using suitable examples illustrate the different weld surfacing methods. (4) 5B. Using relevant sketches explain laser surface alloying process. (3) 5C. What are the primary causes for majority of coating related failures? (3)

Time: 3 Hours

MAX. MARKS: 50

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