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May 2019

M.Tech.-II SEMESTER

PRINCIPLES OF METAL CASTING

(MME-203A-1/MMA-203A-2)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

(i) It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.

(ii) Answer any four questions from Part-B in detail.

(iii) Different sub-parts of a question are to be attempted adjacent to each other.

(iv) Assume suitable standard values if needed.

PART–A

1. (a) List 03 domestic and 03 engineering items produced by casting process. (1.5) CO1

(b) Why cast iron is favourable material for casting process? (1.5) CO1

(c) Suggest any three properties a casting pattern should possess. (1.5) CO2

(d) Write various important elements of gating system. (1.5) CO2

(e) What is the function of a core chaplet in casting? (1.5) CO3

(f) How and where chills are used in casting process. (1.5) CO3

(g) Why is investment casting called so? (1.5) CO4

(h) List any *three* items produced by continuous casting process. (1.5) CO4

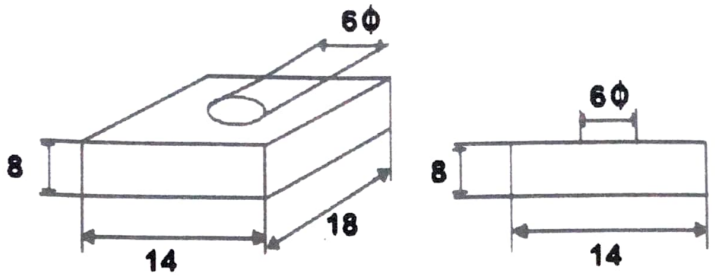
(i) Give examples of any *three* health hazards of casting process. (1.5) CO5

(j) What do you understand by fettling of castings? (1.5) CO5

PART–B

2. (a) Why is color coding important for patterns? Discuss various color codes and their meaning regarding casting patterns. (5) CO2

(b) The casting shown is to be made in cast iron using a wooden pattern. Assuming only shrinkage allowance, calculate the dimension of the pattern and illustrate the dimensions of pattern. (All Dimensions are in inches) (10) CO2



3. (a) Classify the moulding sands and describe in detail two methods used for testing of moulding sand. (7.5) CO3

(b) Why are cores used in casting? Classify cores and discuss their characteristics. (7.5) CO3

4. (a) Classify and discuss melting furnaces for casting. (10) CO1

(b) The height of the down-sprue is 175 mm and its cross-sectional area at the base is 200 mm^2. The cross sectional area of the horizontal runner is 200 mm^2. Assuming no losses, indicate the correct choice for the time (in seconds) required to fill a mould cavity of volume 10^6 mm^3. (Take g=10 m/s^2) (5) CO2

5. (a) Describe metal injection moulding process and its types. (10) CO4

(b) State the criteria under which it becomes advantageous to use the metal injection moulding process over die casting and other casting processes. (5) CO4

6. (a) Describe various method of inspecting castings. (7.5) CO5

(b) Why do some castings need heat treatment and how it is done? (7.5) CO5

7. Write notes on the following :

(a) Limitations of casting processes over others manufacturing processes. (5) CO1

(b) Non-ferrous casting materials. (5) CO1

(c) Modernization of foundry shops. (5) CO1