Ref. No.: Ex/ME/5/T/223/2023

B.E. MECHANICAL ENGG. 2nd Year, 2nd Semester Exam 2023

MANUFACTURING PROCESS

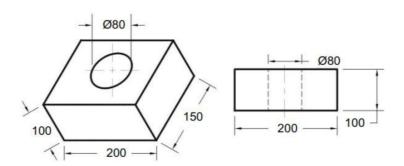
Time: Three hours Full Marks: 100

Answer of part of a question should be written in one place. Draw suitable diagram wherever required. (Preferably by pencil.)

The figures in the margin indicate full marks.

Answer any 05 (five) questions of the following.

- a) Discuss briefly the influence of water-content on moulding sand properties.
 b) What is "Stop-off"? Explain briefly.
 c) What is "Stack moulding"?
 d) What is "System sand"?
- e) The casting shown in Fig. (shown below) is to be made in plain carbon steel using a wooden pattern. Assuming only shrinkage allowance, calculate the dimensions of the pattern.



Assuming only shrinkage allowance, calculate the dimensions of the pattern of plain carbon steel. (For steel the shrinkage allowance is 21.0 mm/m. and for aluminium the shrinkage allowance is 13.0 mm/m.)

For the same example as shown in Fig. 3.3(a), if the master pattern is to be made of aluminium then calculate the dimensions of the wooden pattern which is to be used for making the aluminium pattern. (Sketch the diagram) [10]

2. a) What is permeability of moulding sand?	[2]
b) Calculate the permeability number of sand if it takes 1 min 35 s to pass 2000 cm ³ of air	•
at a pressure of 6 g/cm ² through the standard sample.	[3]
c) Explain briefly with diagram: TIG welding process.	[6]
d) What is soldering and brazing?	[3]
e) Why coating is there on electrode?	[3]
f) Application of SAW.	[3]
3. a) Why allowances are given in pattern?	[2]
b) How many types of allowances are there? Explain them.	[6]
c) Explain different types of pattern in details with diagram.	[8]
d) Define: Core & Core prints	[4]
4. (a) Drawing a neat diagram discuss about different portions of an anvil, mentioning	ng their
functions as well as materials.	[10]
(b) With explanatory diagram discuss about drop forging operation. What are the differe	nt types
of drop forging hammers?	[10]
5. a) Explain briefly the following processes with diagram:	
(i) SAW & (ii) MIG	[6+6]
b) What do you mean by the following terms?	
(i) Coining; (ii) High-energy rate forming; (iii) Progressive piercing.	[6]
6. a) What are different required properties of moulding sand? Discuss it.	[8]
b) How the property 'permeability' is measured in the laboratory?	
Discuss with a lucid diagram in this regard.	[8]
c) Why a sprue pin is made tapered? Discuss with adequate diagram.	[4]
7. a) Explain: Hot forming process & Cold forming process.	[6]
b) Define core, core prints, chaplets and chills. Draw supporting figures to discuss abo	
external and internal chills.	[8]
c) Write any four defects in casting	[4]
d) Explain the function riser.	[2]
8. Write short note:	
a) Extrusion process b) Aspiration effect in sprue	[4×5]
c) NDT testing d) Pattern materials	[4×5]