Total No. of Questions – [04]

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U218-153(T1)

G.R. No.	

OCTOBER 2018/ IN-SEM (T1)

S. Y. B. TECH. (MECHANICAL ENGINEERING) (SEMESTER - I)

COURSE NAME: MANUFACTURING PROCESSES

COURSE CODE: MEUA21173

(PATTERN 2017)

Time: [**1 Hour**] [Max. Marks: **30**]

(*) Instructions to candidates:

1) **Answer Q.1 OR Q.2 and Q.3 OR Q.4.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1) a) Derive the relationship between the height and diameter of the riser for top and side cylindrical riser respectively, for efficient working. [6 marks]

b) Draw a neat sketch of hot chamber die casting process. State any two limitations of the process. [6 marks]

c) State the advantages and limitations (two each) of wood being used as a pattern material. [4 marks]

OR

Q.2) a) A casting experiment performed using a certain alloy and type of sand mould, it took 170 sec for a cube-shaped casting to solidify. The cube was 50 mm on a side. (i) Determine the value of the mould constant in Chvorinov's rule. (ii) If the same alloy and mould type were used, find the total solidification time for a cylindrical casting in which the diameter is 50 mm and length is 50 mm. [6 marks]

b) Explain the following defects in casting process: hot tears, shrinkage cavity and mismatch. [6 marks]

c) With a schematic explain permeability test for moulding sand. [4 marks]

Q.3) a) In a wire drawing operation, why must the drawing stress never exceed the yield strength of the work metal? Also, derive equation to obtain the theoretical maximum reduction possible in a single draw ignoring the effects of friction, redundant work and strain hardening. [6 marks]

b) A high carbon steel solid cylindrical piece having diameter 45 mm and height 88 mm is reduced in height by 25% at room temperature using open die forging. Calculate the forging force at the end of stroke assuming the coefficient of friction

as 0.15 and the work metal strength coefficient 'K' as 425 MPa and strain hardening exponent 'n' as 0.15. [4 marks]

c) Obtain the relation for roll strip contact length (L) and maximum draft (d) possible in a single pass by rolling. [4 marks]

OR

Q.4) a) An aluminium strip 240 mm wide 18 mm thick is rolled to a thickness of 14 mm in one pass. The roll radius is 240 mm and roll rotates at 125 rpm. Calculate the roll force and power required for this operation if the Aluminium has true stress of 78.44 N/mm^2 under unstrained condition and 242.35 N/mm^2 in maximum strained condition. [6 marks]

b) With schematic state any two defects produced in extrusion process. [4 marks]

c) Distinguish between direct and indirect extrusion with sketch. [4 marks]