Registration no: | | | | | | | | | | |

Total Number of Pages: 02

B.TECH
PEME4401

7th Semester Regular / Back Examination 2016-17
PRODUCT DESIGN AND PRODUCTION TOOLING
BRANCH: MECHANICAL
Time: 3 Hours
Max Marks: 70
Q.CODE- Y256

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:** **(2 x 10)**

a) Explain the product design by evolution with one suitable example.
b) Name two different product design processes.
c) What are the functions of choke in the gating system of the casting?
d) How does hand forging differ from machine forging?
e) Differentiate compound die and combination die.
f) What do you mean by flash loss in forging?
g) Write the difference between Jig and Fixture.
h) Sketch a two way clamp.
i) Write some important advantages of limit gauge.
j) How the size of a turret lathe is specified?

Q2 Describe in detail various preliminary operations done on a multi impression die. **(10)**

Q3 **a)** What do you mean by product specification? What are the components of it? Briefly explain the components. **(5)**

b) Explain the process of product development from the design of a product. **(5)**

Q4 A aluminium cube of 120mm side has to be cast along a cylindrical riser of height equal to its diameter. The riser is not insulated on any surface. If the volume shrinkage of aluminium during solidification is 6%. Calculate: **(10)**

(i) Shrinkage volume of cube on solidification
(ii) Minimum size of the riser so that it can provide the shrinkage volume.

Q5 **a)** A hole of 60mm diameter is to be produced in steel plate of 2mm thick. The ultimate shear strength of the plate material is 450N/mm^2. If the punching force is to be reduced to half of the force using a punch without shear, estimate the amount of shear on the punch. Take percentage penetration as 40%. **(5)**

b) Explain the functions of various strippers with suitable diagram. **(5)**

Q6 **a)** Explain about various types of fixtures. **(5)**

b) List and explain the basic requirements of clamping device. **(5)**

Q7 **a)** Describe various rules which must be followed while laying out the sequence of operations for a turret lathe. **(6)**

b) Describe in detail the different types of limit gauge tolerances **(4)**

Q8 **Write short notes on any two:** **(5 x 2)**

a) Deep drawing.
b) Broaching fixture
c) Product specification