Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PEME 6406

Seventh Semester (Special) Examination – 2013

PRODUCT DESIGN AND PRODUCTION TOOLING

BRANCH : MECH

QUESTION CODE : D 487

Full Marks – 70

Time : 3 Hours

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

1. Answer the following questions : 2×10

   (a) How drawing out operation is different from upsetting operation in forging ?

   (b) What is meant by "edge effect" ?

   (c) How the product design by evolution and the product design by innovation are differ from each other ?

   (d) Differentiate the standard gauge and limit gauge.

   (e) How the size of a forging machine is specified ?

   (f) Define process planning.

   (g) What are the main difference between Jigs and fixtures ?

   (h) What do you mean by tear down time and lost time ?

   (i) What is stock stop and pilot.

   (j) Define allowance.

2. (a) Why are the shrinkage cavities caused in casting ? Discuss the methods used for eliminating them. 4

   (b) Design the ingate dimensions for pouring a 15 kg casting in 10 sec, with the runner having a cross section area of 625 mm^2 and the two ingates of 25 mm width each. Assume equal flow through gates. 6

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3. (a) Differentiate between compound die and progressive die. 5

(b) Estimate the blanking force to cut a blank 25 mm wide and 30 mm long from a 1.5 mm thick metal strip, if the ultimate shear stress of the material is 450 N/mm^2. Also determine the work done if the percentage penetration is 25% of material thickness. 5

4. Explain in detail the role of computer in product design. 10

5. (a) Explain the basic rules for die design for upset forging. 5

(b) Briefly discuss about fullering and drawing operations. 5

6. Write the principle and need of clamping in a Jig or Fixture, Explain briefly different clamping methods. 10

7. (a) Describe various rules which must be followed while laying out the sequence of operations for a turret lathe. 5

(b) Explain the various elements of a single point cutting tool with the help of neat diagram. 5

8. Write short notes on any **four** of the following : 2.5×4

(a) Taylors principle of gauge design

(b) Flash and gutter

(c) Drill Jig

(d) Form tool

(e) Stripper.