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BME-003

B.Tech. MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

BTCLEVI/BTMEVI/BTELVI/BTCSVI/BTECVI

Term-End Examination

00285 **December, 2014**

BME-003 : MANUFACTURING TECHNOLOGY

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks. Use of calculator is allowed. Assume any suitable data if found to be missing.*

1. (a) List and describe the typical components produced by centrifugal casting process. *5*

(b) Define choke area in castings. Explain the reasons as to why sprue base is normally used as the choke area for ferrous castings. *5*

2. Prove that h/d ratio of most compact economical riser is 1 and that for top placed riser is 1/2 and that in both cases ratio of volume/area is d/6. *10*

3. (a) What are the common defects found in castings ? What are the causes for these defects and what measures can be taken to avoid defects in castings ? *5*

(b) Define the aspiration effect in casting. Draw and explain the schematic view of ideal and actual shape of sprue. 5

4. (a) Draw a neat sketch of die-punch assembly with all components. Also explain how casting operations such as blanking or piercing differ from deep drawing operation. 5

(b) Describe the process for making a washer with the help of progressive and compound dies. 5

5. A cup without flanges and height 105 mm and diameter 52 mm is to be made from sheet metal 3 mm thick. Determine the suitable number of draws, assuming reductions of 45%, 25%, 20% etc. for each drawing. 10

6. (a) Discuss the principle of gas shielded arc welding process and also give the industrial application of the process. 5

(b) Describe the various methods of welding for high carbon steels. 5

7. (a) What do you understand by carbon arc welding process ? Describe the twin-carbon arc welding technique. 5

(b) Explain the weldability of aluminium explaining clearly the chief problems encountered in its welding. 5

8. (a) List the different types of resistance welding processes. Explain the working principle of any one resistance welding with the help of a neat diagram. *5*

(b) Write a short note on TIG welding. *5*

9. (a) What do you mean by tool signature ? Explain the various cutting angles for a single-point cutting tool with the help of a neat diagram. *5*

(b) What are the functions of cutting fluid used for mild steel ? Also explain the desirable properties for a good cutting fluid. *5*

10. During orthogonal machining of a mild steel tube at 15 m/min, using a 15° rake HSS tool, the following data were obtained/recorded : *10*

Chip thickness ratio = 0·35

Coefficient of friction = 0·60

The friction force on the chip tool interface was measured by a special set-up as 48 kg f. Determine the components of cutting force, shear angle and work done in deformation.
