Code : 021409

B.Tech 4th Semester Exam., 2019

MANUFACTURING BY SHAPING AND JOINING

Time : 3 hours *Full Marks* : 70

Instructions :

(i) The marks are indicated in the right-hand margin.

*(ii) There are **NINE** questions in this paper.*

*(iii) Attempt **FIVE** questions in all.*

*(iv) Question No. **1** is compulsory.*

1. Choose the correct option of the following (any *seven*) : 2×7=14

(a) Carbon arc welding uses
- *(i)* straight polarity DC
- *(ii)* reverse polarity DC
- *(iii)* AC
- *(iv)* pulsed AC

(b) Which of the following joining methods does not use filler metal?
- *(i)* Gas welding
- *(ii)* Arc welding
- *(iii)* Resistance welding
- *(iv)* Soldering

(c) Welding produces a
- *(i)* permanent joint
- *(ii)* semipermanent joint
- *(iii)* temporary joint
- *(iv)* cotter joint

(d) A wax pattern is used in
- *(i)* investment casting
- *(ii)* shell-mould casting
- *(iii)* centrifugal casting
- *(iv)* die casting

(e) Investment casting is suitable for
- *(i)* small size casting
- *(ii)* medium size casting
- *(iii)* large size casting
- *(iv)* very large size casting

(f) Refractory slurry is used in
- *(i)* shell-mould casting
- *(ii)* centrifugal casting
- *(iii)* investment casting
- *(iv)* die casting

(g) Which of the following metals has the highest sintering time?
- *(i)* Copper
- *(ii)* Iron
- *(iii)* Tungsten
- *(iv)* Stainless steel

(h) Sintering temperature is approximately equal to

(i) 25% of melting temperature

(ii) 50% of melting temperature

(iii) 75% of melting temperature

(iv) 100% of melting temperature

(i) In forging operation, workpiece is usually subjected to

(i) compressive stress

(ii) tensile stress

(iii) shear stress

(iv) bending stress

(j) Hot-die forging is also known as

(i) isothermal forging

(ii) roll forging

(iii) precision forging

(iv) embossing

2. (a) Discuss briefly the materials which are added to moulding sand to improve their moulding properties. 7

(b) Describe the need of investment casting. Explain the investment casting process. 7

3. (a) How can the casting defect 'hot tears' be eliminated? 7

(b) Explain briefly various 'cold forging techniques'. 7

4. Compare the features of powder metallurgy with casting, forging (hot), extrusion (hot) and machining processes. 14

5. (a) Explain briefly 'particle size, distribution and shape' in powder metallurgy technique. 7

(b) Explain briefly 'pultrusion'. 7

6. (a) What are the important design considerations in brazing parts? 7

(b) What are the functions of 'electrode coatings'? 7

7. List the advantages and limitations of DC and AC power sources in arc welding. 14

8. (a) Explain briefly soft soldering and hard soldering. 7

(b) What is 'braze welding'? Explain briefly. 7

9. Explain briefly any *two* of the following : 7×2=14

(a) Embossing

(b) Coining

(c) Injection moulding

★ ★ ★