

B.TECH.

THEORY EXAMINATION (SEM–VIII) 2016-17 ADVANCE MATERIAL TECHNOLOGY

Time : 3 Hours

1.

Max. Marks : 100

www.FirstRanker.Edfn³

Note: Be precise in your answer. In case of numerical problem assume data wherever not provided.

SECTION – A

 $10 \ge 2 = 20$

 $5 \ge 10 = 50$

 $2 \ge 15 = 30$

- (a) Differentiate between the plain carbon steel and tool steel.
- (b) Explain about the normalizing of steel.
- (c) Write the application of plain carbon steel.
- (d) Write down the advantages of high temperature resistance steel.
- (e) Explain the radioactive waste disposal in short.
- (f) What are biomaterials?

Explain the following:

- (g) Explain what is process annealing.
- (h) Write the property of aluminum alloy.
- (i) Write application of smart material.
- (j) Classify the different types of aluminum alloys.

SECTION – B

2. Attempt any five parts of the following questions:

- (a) Write the typical composition of T-series and M-series high speed steel. Now a day's these high speed steels are coated with certain ceramic materials. How do these coatings improve its properties?
- (b) Describe how normalizing heat treatment of 0.3% carbon steel be carried out and what will its properties be after this normalizing heat treatment?
- (c) What is dispersion strengthened composite materials? Why are its mechanical properties better than those of alloys?
- (d) Describe the various mechanical properties that are needed in biomaterials used for different applications. How are these properties tested?
- (e) Why are breeder reactors? What are they used for? What is the use of heavy water in nuclear reactors? Why is it suitable for that application?
- (f) What are stainless steels? Classify the different types of stainless steel and write the composition and properties of any one stainless steel
- (g) What are the advantages of induction hardening over flame hardening? Discuss when these surface hardening treatments are needed to be performed.
- (h) Name some methods by which refractory materials can be coated on alloys. How do these coating affect their properties and what are the application areas of such coating?

SECTION – C

Attempt any two parts of the following questions:

- **3** What are nuclear materials? Classify the different types of nuclear materials. What is the difference between fissile and fertile materials? Give examples.
- 4 Describe the various types of steels, polymers, ceramics and composites that are used as biomaterials. Also mention where these biomaterials find their applications.
- 5 Name some methods by which refractory materials can be coated on alloys. How do these coating affect their properties and what are the application areas of such coating?

www.FirstRanker.com