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B.TECH.

THEORY EXAMINATION (SEM–VIII) 2016-17

ADVANCE MATERIAL TECHNOLOGY

Time : 3 Hours ***Max. Marks : 100***

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

SECTION – A

1. Explain the following: **10 x 2 = 20**

(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?

(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: **5 x 10 = 50**

(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: **2 x 15 = 30**

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?