G. S. Mandal's

Maharashtra Institute of Technology, Aurangabad

(An Autonomous Institute)

END SEMESTER EXAMINATION

Second Year B.Tech (Branch) – Feb/Mar-2023

(PPE)

Course Code : PPE204   Course Name : Material Science

Duration : 2 Hrs   Max. Marks : 50   Date :

Instructions :

i)   All questions are compulsory
ii) Assume suitable data wherever necessary and clearly state it
iii) Figures to right indicate full marks

Q. 1	Answer any five(Marks:10)				
		Marks	CO	BL	PI
a)	Explain the term refractive index	2	CO 1	Level 1	
	The refractive index is an important optical property which is defined as ratio of speed of light in vacuum to speed of light in material				
b)	Define the term tensile strength	2	CO 2	Level 1	
	The tensile strength is defined as resistance of a material to break under tension.				
c)	What is the formula for calculating strain?	2	CO 3	Level 3	
	The deformation of a material due to stress is strain.				
d)	Explain the term unit cell.	2	CO 1	Level 1	
	It represent smallest entity of crystal structure				
e)	State examples of magnetic properties of material.	2	CO 3	Level 1	
	Ferromagnetism or paramagnetism or diamagnetism				
f)	What is the use of fiber-reinforced material?	2	CO 2	Level 3	
	It is used to provide strength. For example in building materials or in medical science				
g)	Name any two alloys of zinc.	2	CO 4	Level 1	
	Brass and german silver				
h)	State an example of ceramic.	2	CO 6	Level 3	

	Potteries at home. Refractories in industry.				
Q. 2	Classify ceramics into different categories.	8	CO 4	Leve 12	
	Ceramics are also classified as traditional or advanced. They are also classified on the basis of composition, for example silicate based, oxide based, carbide based and nitride based. Glass crystalline, polycrystalline polymer based. They can be classified as clay product, refractories, glass, abrasives or cement.				
Q. 3	How to evaluate hardness value for a given material?	8	CO 2	Leve 13	
	Hardness is an important mechanical property of material. Brinell hardness test, Rockwell hardness test, Vicker's hardness test, Mohr's hardness test or Knoop's hardness test are used for calculating hardness values.				
Q. 4	Identify important features of metallic materials.	8	CO 4	Leve 11	
	1. High density 2. Solid 3. Conductivity 4 ductility 5.maleability 6. Lustrous 7. Melting point is high 8. Ability to be processed and offer strength				
Q. 5	Explain similarities and differences between piezoelectric and pyroelectric materials	8	CO 3	Leve 12	
	Piezoelectric means on application of mechanical pressure electric voltage is generated. Pyroelectric means on changes in temperature of material voltage is generated. Both are used for voltage and hence electricity generation. They are expensive to prepare. Piezoelectricity is common in non cetrosymmetric materials and pyroelectricity is common in polar crystal symmetry class materials.				
Q. 6	Draw a tree diagram to classify materials into different categories.	8	CO 6	Leve 16	

Note:- All course outcomes shall be addressed.