Roll. No.

Signature of Invigilators

Metallurgical and Materials Engineering (19/39)

(in figures as in Hall Ticket)

Roll No. _____

_____

_____

(in words)

Maximum Marks: 50   **No. Of Printed Pages : 8**

Instruction for the Candidate:

1. Write your Roll Number in the space provided on the top of this page.
2. This paper consists of **FIFTY (50)** multiple choice type questions. Each Question carries **ONE (1)** mark.
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below:
   a. To have access to the Question Booklet, tear off the paper seal on the edge of this cover page, Do not accept a booklet without sticker seal and do not accept an open booklet.
   b. Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faculty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
   c. After this verification is over, the Test Booklet Number should be entered on the OMR Answer Sheet and the OMR Answer Sheet Number should be entered on this Test Booklet.
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.

   Example: Ⓐ ● Ⓒ Ⓓ where (B) is correct response.
5. Your responses to the items are to be indicated on the OMR Answer Sheet under Paper – II only. If you mark your response at any place other than in the circle in the OMR Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.
9. You have to return the original OMR Answer Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are however, allowed to carry original question booklet and duplicate copy of OMR Answer Sheet on conclusion of examination
10. Use only Blue/ Black Ball point pen.
11. Use of any calculator or log table etc., is prohibited.
12. There shall be no negative marking.

Metallurgical and Materials Engineering
(19/39)

Note: This paper contains **FIFTY (50)** multiple-choice questions. Each Question carries **ONE (1)** mark.

Q-1	Which of the following gases are used in tungsten inert gas welding?		
	(A) Hydrogen and oxygen	(B)	CO_2 and H_2
	(C) Argon and helium	(D)	Helium and neon
Q-2	Welding process in which two pieces to be joined are overlapped and placed between two electrodes is known as		
	(A) Percussion welding	(B)	Projection welding
	(C) Seam welding	(D)	Spot welding
Q-3	The average number of grains per square inch (N) is		
	A $N = 2^{2n-1}$	B	$N = n^2 - 1$
	C $N = 2^{n-1}$	D	$N = (2n-1)^2$
Q-4	Gibb's phase rule is given by the expression in which F is equal to		
	(A) $C + P$	(B)	$C - P$
	(C) $C - P - 2$	(D)	$C - P + 2$
Q-5	Crystal structure of metals is studied by		
	(A) Metallographic techniques	(B)	X-ray technique
	(C) Ultrasound technique	(D)	Electron microscopy
Q-6	The entropy change for a spontaneous process is		
	(A) > 0 for the system	(B)	< 0 for the system
	(C) >0 for the system and the surrounding	(D)	< 0 for the system and the surrounding
Q-7	Stainless steel is welded using		
	(A) Oxy-acetylene flame	(B)	Oxy-hydrogen flame
	(C) Arc welding	(D)	Inert gas arc welding
Q-8	The most important mineral of magnesium is		
	(A) dolomite	(B)	chalcopyrite
	(C) Pyrite	(D)	siderite
Q-9	Magnesium chloride obtained from sea- water by		
	(A) Pidgeon process	(B)	Dow process
	(C) Bayer Process	(D)	Hall-Heroult Process
Q-10	Aluminum mineral is		
	(A) Pyrite	(B)	magnesite
	(C) Gibbsite	(D)	kainite
Q-11	Facets, river patterns are observed in		
	A Fatigue fracture	B	Ductile fracture
	C Brittle fracture	D	Intergranular fracture
Q-12	Chalcopyrite is a mineral of		
	(A) copper	(B)	Nickel
	(C) Iron	(D)	Lead

Q-13		The hardness number 1 on Moh's scale is assigned to		
	A	quartz	B	talc
	C	topaz	D	corundum
Q-14		Galena is a mineral of		
	(A)	Zinc	(B)	Lead
	(C)	Nickel	(D)	Tin
Q-15		Carbonyl process of refining is used for		
	(A)	aluminum	(B)	Nickel
	(C)	Copper	(D)	Zinc
Q-16		Uranium is extracted from		
	(A)	Metal Oxide	(B)	Metal Sulphide
	(C)	Metal Halide	(D)	Metal choride
Q-17		Extraction of silver is carried out by		
	(A)	Amalgamation process	(B)	Cyanidation process
	(C)	Chlorination process	(D)	Kroll's process
Q-18		For better fluidity which of the following is added in blast furnace?		
	(A)	Phosphorous	(B)	Carbon
	(C)	manganese	(D)	Sulphur
Q-19		In screw dislocation the direction of movement is		
	A	Parallel to the stress direction	B	Perpendicular to stress direction
	C	At 60° to stress direction	D	None of these
Q-20		Efficiency of blast furnace depends on		
	(A)	Permeability of charge	(B)	Quality of coke
	(C)	Both (a) and (b)	(D)	None of the above
Q-21		The process by which the plastic deformation is produced by dislocation motion is		
	A	climb	B	Cross-slip
	C	slip	D	Dislocation pile up
Q-22		The primary heat producer in acid Bessemer process is		
	(A)	P	(B)	Si
	(C)	S	(D)	Mn
Q-23		Mechanical deformation of lead at room temperature is		
	A	Hot working operation	B	Cold working operation
	C	None of these	D	Warm working operation
Q-24		The acid Bessemer process require, charge as		
	(A)	Tundish iron	(B)	Pig iron
	(C)	Swedish iron	(D)	Thomos grade iron
Q-25		Materials with high cohesive strength means high		
	(A)	Boiling point	B	Freezing point
	(C)	Melting point	D	Triple point
Q-26		Recrystallization temperature depends on		
	A	Amount of prior cold work	B	Carbon content
	C	Purity of alloy	D	Both (a) and (b)

Q-27	The crystal structure of gamma iron is			
	(A)	orthorhombic	(B)	BCC
	(C)	FCC	(D)	Hexagonal
Q-28	The height to diameter ratio of LD furnace is			
	(A)	1	(B)	1.5
	(C)	2	(D)	2.5
Q-29	Blast furnace gas is used for			
	(A)	Fuel for other plants	(B)	Is discharged into atmosphere
	(C)	Recirculated back to blast furnace	(D)	All of these
Q-30	Lining of open hearth furnace			
	(A)	Provides insulation to contain heat within the furnace	(B)	Controls impurities in steel
	(C)	Acts as structure	(D)	Enhance furnace life
Q-31	Nickel is			
	(A)	Ferroelectric	(B)	Paramagnetic
	(C)	ferromagnetic	(D)	dielectric
Q-32	Resilience is measured by			
	(A)	Plastic energy	(B)	Both A and B
	(C)	Elastic energy	(D)	None
Q-33	Stainless steel main elements contains			
	(A)	Cr, Ni, Fe	(B)	Cr, Ni
	(C)	Fe, C	(D)	Cr, Ni, Fe and C
Q-34	Which of the following is the most ductile material?			
	(A)	Copper	(B)	Lead
	(C)	Mild steel	(D)	Vanadium
Q-35	The area under the stress-strain curve in ductile material exhibit			
	(A)	Hardness	(B)	Strength
	(C)	Toughness	(D)	Ductility
Q-36	Hardness of martensite is			
	(A)	RC-65	(B)	RC-32
	(C)	RC-80	(D)	RC-48
Q-37	For alloys, recrystallization temperature is			
	A	0.2 Tm	B	0.5 Tm
	C	0.7 Tm	D	0.9 Tm
Q-38	The Luder's band is observed in			
	A	Ductile fracture	B	Fatigue fracture
	C	Deep drawing of sheet	D	Yield point phenomenon
Q-39	Increase in flow stress with plastic deformation is due to			
	A	Dislocation multiplication	B	Dislocation pile up
	C	Partial dislocation	D	Dislocation annihilation

Q-40	On decreasing the grain size in polycrystalline material the property most likely to deteriorate is			
	A	Toughness	B	Creep
	C	Tensile strength	D	Fatigue
Q-41	Microstructure that develops in steel depends on			
	A	Heat treatment process	B	Carbon content
	C	Both (a) and (b) above	D	None of the above
Q-42	Intergranular corrosion occurs			
	(A)	Along grain	(B)	Along the grain boundary
	(C)	At the surface	(D)	In the core of material
Q-43	Von Mises criterian for plastic yielding of a ductile metal predicts that the yield stress in uniaxial tension is related to that in pure torsion is			
	A	Equal to each other	B	$\sqrt{3}$ times
	C	2 times	D	One half
Q-44	Rockwell reading is the measure of the penetration caused by the			
	A	Major load only	B	Minor load only
	C	Both major and minor load	D	Standard load
Q-45	Atomic packing factor in Body centered cubic structure is			
	(A)	0.74	(B)	0.68
	(C)	0.52	(D)	0.56
Q-46	In n-type semiconductor the impurity added as dopant is			
	(A)	B	(B)	Al
	(C)	Sb	(D)	In
Q-47	In brittle material the type of fracture observed is known as			
	(A)	cup and cone type	(B)	cleavage
	(C)	beach mark	(D)	chevron pattern
Q-48	Steel is a which type of solid solution			
	(A)	Ordered substitution solid solution	(B)	Disordered substitution solid solution
	(C)	Interstitial solid solution	(D)	Not a solid solution
Q-49	The chemical formula for rust is			
	(A)	Fe_2O_3	(B)	$Fe(OH)_2$
	(C)	$Fe(OH)_3$	(D)	Fe_3O_4
Q-50	Turbine rotor is made by			
	(A)	Rolling	(B)	Sand casting
	(C)	forging	(D)	Extrusion

****

Rough Work: