Register	No.:		Na	me :			
SAIN'	TG	ITS COLLEGE OF ENG	INE	ERING (AUTONOMOUS)			
(AF	FILI	TED TO APJ ABDUL KALAM TECHNOLO	GICAL U	NIVERSITY, THIRUVANANTHAPURAM)			
	5	SIXTH SEMESTER B.TECH DEGREE	EXAM	INATION (S), AUGUST 2023			
		MECHANICAL E	CNGINE	ERING			
		(2020 SC	HEME)				
Course (Code	: 20MET308					
Max. Ma	rks	50		Duration : 75 Minutes			
		PAR'	ГА				
		(Answer all questions. Each	quest	ion carries 1 mark)			
1	Bei	noulli's equation in fluid dynamic	s descr	ibes the conservation of			
	А.	Mass	В.	Energy			
	C.	Momentum	D.	Viscosity			
2	The	e type of fluid flow analysis where	the obs	erver remains stationery is called			
	А.	Eulerian	В.	Lagrangian			
	C.	Archamedis	D.	None			
3	Th soli	e region between the separation st d body is known as	treamli	ne and the boundary surface of the			
	А.	Wake	В.	Lift			
	C.	Drag	D.	Boundary Layer			
4	Αb	ody floating in a liquid is said to b	e in ne	utral equilibrium, if its metacentre			
	А.	coincides with its centre of gravity	В.	lies above its centre of gravity			
	C.	lies below its centre of gravity	D.	lies between the centre of buoyancy and centre of gravity			
5	Wh	Which of the following is a non-Newtonian fluid?					
	А.	Water	В.	Air			
	C.	Honey	D.	Mercury			
6	Unit of surface tension is						
	А.	N/m^2	В.	Nm			
	C.	N/m	D.	Ν			
7	Wh	ich phase diagram region indicate	s a uni	form composition of two phases?			
	A.	Liquidus	В.	Solidus			
	C.	Eutectic	D.	Peritectic			
8	Hardenability of steel is assessed by						
	А.	Charpy impact test	В.	Jominy end quench test			
	C.	Open hole test	D.	Rockwell hardness test			
9	Which source is responsible for the multiplication of dislocations in a crystal?						
	А.	Forest dislocation	В.	Frank-Read source			
	C.	Grain boundary	D.	Dislocation line			

F

Total Pages : 4

10	Which of the following type of materials are usually the most ductile?					
	А.	BCC lattice	В.	HCP lattice		
	C.	FCC lattice	D.	SC lattice		
11	Lin	e imperfections is known as				
	А.	Edge dislocations	В.	Misrun		
	C.	Screw dislocations	D.	Schottky defect		
12	Atc	omic packing factor of FCC crystal s	tructi	are is		
	А.	0.52	В.	0.68		
	C.	0.58	D.	0.74		
13	Wha eng	at is the term used to describe the r ine operating between two temperat Carnot efficiency	naxin ure ro B	num possible efficiency of a heat eservoirs? Rankine efficiency		
	л. С	Browton efficiency	D. П	Otto efficiency		
14	C.	brayton enciency	D.	and Clausius statement if one		
14	stat A.	ement between the two is violated t other one may be or may not be violated	hen B.	other one is also violated		
	C.	other one must be correct	D.	none of the above		
15	In v	which thermodynamic process is hea	at tra	nsfer equal to zero		
	А.	isentropic	В.	isothermal		
	C.	isobaric	D.	isochoric		
16	Whi cycl A.	ich law states that it is impossible to le and extracts no heat while deliver Zeroth Law of Thermodynamics	o cons ing w B.	struct a device that operates in a ork? First Law of Thermodynamics		
	C.	Kelvin-Planck Statement	D.	Clausius Statement		
17	Whi	ich statement accurately describes a	a reve	ersible process?		
	А.	It occurs at a finite rate.	В.	It always achieves maximum efficiency.		
	C.	It involves irreversible changes.	D.	It violates the second law of thermodynamics.		
18	If a syst	closed system is undergoing an irre tem	versil	ble process, the entropy of the		
	А.	must increase	В.	must decrease		
	C.	always remains constant	D.	can increase, decrease or remain constant		
19	Two surfaces A & B are to be joined together. Select the joining operation in					
	whi A.	arc welding	B.	adhesive bonding		
	C.	brazing	D.	spot welding		
20	The	roll separating force between the ro	olls wi	ill increase if		
	А.	roll diameter increases	В.	roll diameter decreases		
	C.	number of rolls increases	D.	number of rolls decreases		
21	In fusion welding process, within heat affected zone (HAZ) the work material undergoes					
	А.	micro structural changes but does not melt	В.	neither melting nor micro		
	C.	both melting and micro structural after solidification	D.	melting and retains the original micro structure after solidification		

 A. Gas metal arc welding B. Submerged arc welding C. Gas tungsten arc welding D. Flux coated arc welding 23 Injection moulding is a process used for processing A. Aluminium B. Nickel C. Steel D. Plastics 24 Riser is designed so as to A. minimize the time of pouring B. freeze before the casting freezes C. freeze at the same time as the D. freeze after the casting freezes C. freeze at the same time as the D. freeze after the casting freezes C. freeze at the same time as the D. freeze after the casting freezes C. freeze at the same time as the D. four binary freezes C. 12 D. 15 26 In a kinematic chain, a quaternary joint is equivalent to: A. One binary joint B. Two binary joints C. Three binary joints D. Four binary joints C. ellipse D. straight line 28 In a rigid link AB, the point B is moving with respect to A. Then the acceleration of B will be equal to A. acceleration of A × distance AB C. vector sum of acceleration of A D. acceleration of A × square of and acceleration of B, relative to A. acceleration of B, relative to A. DC reversible motor B. Fast and loose pulleys C. Whitworth motion D. Slotted link mechanism 	 A. Gas metal arc welding B. Submerged arc welding C. Gas tungsten arc welding D. Flux coated arc welding Injection moulding is a process used for processing A. Aluminium B. Nickel C. Steel D. Plastics Riser is designed so as to A. minimize the time of pouring B. freeze before the casting freezes casting What is the number of instantaneous centres of rotation for a 6-link mechanism? A. 4 B. 6 C. 12 D. 15 In a kinematic chain, a quaternary joint is equivalent to: A. One binary joint B. parabola C. ellipse D. straight line In a rigid link AB, the point B is moving with respect to A. Then the acceleration of B will be equal to A. acceleration of A × distance AB B. (acceleration of A × square of and acceleration of B, relative to A cost straight line The type of quick return mechanism employed mostly in shaping machines is: A. DC reversible motor B. Fast and loose pulleys C. Whitworth motion D. Slotted link mechanism When the relative motion between two elements is completely or successfully constrained, then these two elements from a A. mechanism B. machine C. kinematic chain, guestion carries 2 marks) A tank containing water upto a depth of 650 mm is stationary. Find the force exerted by the fluid of specific gravity 0.55 on the side of the tank. The width of the tank is 1.5m A tank containing water upto a depth of 650 mm is stationary. Find the force exerted by the fluid of specific gravity 0.55 on the side of the tank. The width of the tank is 1.5m	22	Which one among the following welding processes uses non-consumable electrode?					
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			iii. Motion of liquid inside impeller iv iv Motion of eddies in rivers an	of pui d can	mp als			
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33	A metal sample has an original length of the sample elongates to 11 cm. What is	of 10 the s	cm. After applying a tensile stress, strain experienced by the sample?			
	A. 0.1	D. П	0.01			
24	C. 0.9		0.09			
34	stress experienced by the material?	JU GF	a and a strain of 0.002. What is the			
	A. 100 MPa	В.	200 MPa			
	C. 400 MPa	D.	800 MPa			
35	In the study of phase diagrams, the ruproportions of liquid and solid material temperature is known as	ile wł preso	nich helps to calculate the relative ent in the mixture at any given			
	A. Hume-Rothery rule	В.	Empirical rule			
	C. Gibb's phase rule	D.	Lever rule			
36	A steam turbine receives steam steadily kJ/kg and discharges at 1 bar with an is 250 kJ/kg. The changes in kinetic ar The heat transfer from the turbine casi A. 0 kJ C. 150 kJ	v at 10 enthand poing to B. D.	0 bar with an enthalpy of 3000 alpy of 2700 kJ/kg. The work output tential energies are negligible. the surroundings is equal to 50 kJ 250 kJ			
37	The number of dislocations is directly r	propoi	ctional to and inversely			
-	proportional to	- 1				
	A. Shear modulus, Burgers vector	В.	Shear modulus, Stress			
	C. Stress, Shear modulus	D.	Burgers vector, Stress			
38	The welding flame characterized by acetylene and oxygen in equal ratio is					
	A. Neutral flame	В.	premixed flame			
	C. Oxidising flame	D.	Carburizing flame			
39	The transmission angle in four bar mechanism is maximum or minimum for					
	A. $\theta = 90^{\circ} \text{ or } \theta = 0^{\circ}$	В.	$\theta = 30^{\circ} \text{ or } \theta = 90^{\circ}$			
	C. $\theta = 14.5^{\circ} \text{ or } \theta = 20^{\circ}$	D.	$\theta = 180^{\circ} \text{ or } \theta = 0^{\circ}$			
40	The degrees of freedom for the mechanic	ism sl	hown below is			
	A1	В.	0			
	C. 1	D.	2			