Answer Key Ph.D. Entrance Test [Mechanical Engg MRSPTU]

- 1. B
- 2. C
- 3. C
- 4. D
- 5. B
- 6. A
- 7. D
- 8. C
- 9. A
- 10. C
- 11. B
- 12. C
- 13. B
- 14. A
- 15. D
- 16. B
- 17. A
- 18. A
- 19. A
- 20. D
- 21. C
- 22. B
- 23. D
- 24. C
- 25. C
- 26. C
- 27. D
- 28. C
- 29. A
- 30. D

- 31. A
- 32. D
- 33. A
- 34. C
- 35. A
- 36. D
- 37. A
- 38. C
- 39. B
- 40. C

Controller of Examinations
MRSPIU, Ballings

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		-11.1 '41 15.61.4.1.1 18.4 18.4 18.4
1. Which of the following s	statements about eigenvalues a	and eigenvectors is correct?
b) Figenvectors of a sy	mmetric matrix corresponding	to distinct eigenvalues are orthogonal.
c) Every square matrix	has real eigenvalues	
d) Eigenvalues are always	ays positive.	The second form of the holy to be a trained to
2 16 ((v)=v3 2v+1 and f(v	cotisties the conditions of th	e Mean Value Theorem on the interval
2. If I(x)=x = 3x+1, and I(x	(a) where the theorem holds?	
	'c' where the theorem holds?	is the same presenting and the risk in-
a) $c = 0.5$	b) $c = 1.5$	क का मार्थ कर्मा का मार्थ कर कर कर कर के किया है।
c) c = 1	d) c = 2	ा है। विकास स्थाप करानी आप भारत स्थापित हैं है।
2 The one dimensional he	at equation $\partial u/\partial t = k\partial^2 u/\partial x^2 d$	escribes:
5. The one-dimensional ne		
a) Conservation of mas		the state of the second of the paper is the
b) Conservation of mor	mentum.	and the second section of the section of t
 c) Heat conduction in a 	ı rod.	The state of the s
d) Wave propagation in	n a string.	A CONTRACTOR
	The state of the s	
4. The roots of the characte	eristic equation for the Cauchy	y-Euler equation
$v^{2}[d^{2}v/dv^{2}] + 5 \times [dv/dx] +$	- 6y=0 are real and distinct. Th	e general solution is:
a) $y=C_1x^m+C_2x^{m+1}$	b) $y=C_1x^2+C_2x^3$	
c) $y=C_1x^{-2}+C_2x^{-3}$	d) $y=C_1x^{-1}+C_2x^{-2}$	the day activities by Millery for said in the
c) y=C1x -+C2x	u) y-C1x +C2x	त महिन्द्र कर । जन्म सूर्व महिन्द्रमान क्रिकार सिन्द्र हैंदे हैंदे हैंदे हैंदे
5. For a complex function	$f(z)=u(x,y)+i\{y(x,y)\}$, where:	z=x+iy, the function is analytic if:
The Levien of w	and v vanishes	
a) The Laplacian of u.	as of u and v satisfy the Cauc	hy-Riemann equations.
b) The partial derivative	les of u and v satisfy the Cade	
c) The gradient of u an	d v are ortnogonal.	to be made yearden an restriction with the
d) f'(z) is non-zero eve	erywhere in its domain.	
in the service on her time	Shift Stan Palent Hall I have been as a set	ch region?
6. The Laurent series of a	function f(z) converges in whi	ch region?
a) Inside the annular re	egion between two singularitie	S. and training of course of forested of
b) The entire complex	plane.	20 · 保管 独身保持管理 医环状性切除 20 · 作为不为为 2 · 2 · 2
c) Only on the boundar	ry of the annular region.	e e presentant ment in our 2016.
d) In a small region are		
est of an apticipation of the figure is a section of		erenta francisco en 30 ción o 111.
7 In a Binomial distribution	on the sum of probabilities of	all possible outcomes is:
7. Ill a Dillomiai distributio	h) n	A service in the second contract of and if
a) n	do I have the large day of	and the state of t
c) 0.5	u) I	
	Complete Via sin	on but
	of a random variable X is giv	en by:
a) JXdx		
		Property the a at the property of
c) $\sum XP(X)$ for discrete	2 X.	
d) $\sum Y^2 P(Y)$	X Control of the Cont	and scottledge warming
d) ZX P(X)	AND AND LED MATER OF ON A PARK	som topppskir beltisk fri
o Which of the following	is an explicit single-step meth	nod for solving ordinary differential
equations?	ightic victories	
a) Euler's method	to legacity and abstract or a beauti-	it in their been died, is not that if the time will d
b) Backward Euler met	hod	titus - 2 f. (4
c) Trapezoidal rule	the mention	difficulty by a large of
d) Gauss-Seidel method	1	instable a sile a season.
u) Gauss Scraot memor	A-	
four best com can	eld paper by bulkers as he ogetic-	Controlled the delication and real results.
		a special condition

10. Which of the following is		w termine and any works and a committee
10. Which of the following is	true regarding riveting?	The source of testal rists and the
a) Riveling is used for high-	-strength joints in thin mater	iale
, and a secured permane	alli lullus inat cannot ne undo	me
d) Rivets are typically used	for high-temperature joints	And the second section of the second section s
그들은 그렇게 그 아이들이 아니는 아이들이 살아 있다. 그렇게 하는 그들이가 있다. 그림은 점하는		
11. In the analysis of planes -i-	Probable of to probabilize of	distributes of the land in the intervention
11. In the analysis of planar rig	gid body motion, the instanta	neous center of rotation:
, — at the geomethic ce	Hier of the rigid body	
o) is a point on the body th	at has zero velocity at an inc	tant of time
of as arrays at the fixed his	VOT Of the hody	
d) Does not exist for pure t	translation	그 물론이 내려지 않아 나를 살아 먹다고 했다.
사람이 구역하는 반대를 받아 먹다고		a i nopo tesa fallo fallo di segundi.
12. For a particle of mass m	novino del 1	
impulse-momentum releti	loving with velocity v, under	the action of a constant force F, the
impulse-momentum relati a) $mv^2 = 2F.s$	ionship is given by:	b of the distribution of the de
	b) $F = d(mv)/dt$	THE RESERVE TO THE PROPERTY OF THE PARTY OF
c) $F \cdot t = m(v_2 - v_1)$	d) ΔKE=F·s	The second of th
	deniality of selection is a selection	그리고 내내가 얼마나 하는 것 같아 했다.
In a rigid body planar colli	sion, the coefficient of restitu	ation 'e': * * 1 zerolet z z 1 feligio 1,5
a) Is the ratio of initial vel	locities along the line of	mon er. was transfer as a standard to
b) Is the ratio of final rela	tive velocity to the line of impa	action et:
d) Is determined and a	for perfectly inelastic collision	ons
d) is determined only by t	he angle of impact	ons ((xa))= (x)(no lo cal actignos peoble
19일 대통령 왕씨를 받아 보고 기가지 않	San San San San San	he Lapistian of Card vivide
14. In a plane truss, a zero-force	e member is identified when	 ii) The Laplestian of a and a vittish iii) The partial derived very of it much
a) Two non-collinear mem	bers meet at a joint with no e	xternal load or support
b) Two collinear members	meet at a joint with no autom	actual load or support
c) A joint is under equilibri	ium with multiple external fo	nal load or support
d) The truss is symmetric v		orces
a) The truss is symmetric v	vith respect to an axis	(Afternoon of the control of the control of the
15 Daissan		a) losios ine anunas region hatra
15. Poisson's ratio is defined a		AND STREET STREET, STREET, ST. C.
a) The ratio of longitudinal	strain to lateral strain	and religions dan will d
b) The ratio of shear stress	to choose steels	with a first floor or the graduation.
c) The ratio of stress to stra	in in the lateral direction	of ma and other trans and the
 c) The ratio of stress to strain in the lateral direction d) The ratio of lateral strain to longitudinal strain 		· · · :
-, into or faccial strati	to longitudinal strain	in a Algemie) distribution the sup-
16 For a thin-walled cylindria		
by:	al pressure vessel under inter	nal pressure p, the hoop stress is give
김영영 (12일이 없는 일본 사용하다 그는 이번 그는 기능은 다리		그렇게 되어 어린다면 그 그는 그를 하는 것 같아.
a) pr/2t b) pr/t	The expectation intron in a tundom
c) 2pr/t	l) pt/r	an amor a to manally demonstractive acti.
[17] 20 [18] 12] 12] 12] 12] 12] 12] 12] 12] 12] 12	취하 2~10kg	167. (6.
17. Bending stress in a beam is	mavimum	(X)*(X)
a) At the outermost fibers	maximum.	X planath self (XXXX) (a
b) At the contention libers		(x)9*X2 (b)
b) At the neutral axis		1.50
c) At the centroid of the cr	oss-section	
d) Throughout the cross-se	ection	Walch of the following is an expilei-
		Tennings,
18. The critical load for a colum	nn using Euler's face 1	proportional to:
a) 1/1 2	in using Euler's formula is p	proportional to:
	, –	and the story of the
c) L) sqrt{L}	The street Telephone and the San
		dy Gaysa-Serdel method
19. Which of the following is a	typical advantage of abrasis	e jet machining over traditional
machining processes?	J. The manuage of abidsiv	o joi macining over traditional
a) Ability to machine hard	and beittle	
b) High cutting accest	and brittle materials	
b) High cutting efficiency		
c) Better surface finish		
d) Reduced tool wear		

- 20. In a slider-crank mechanism, the crank rotates at a constant angular velocity. The maximum velocity of the slider occurs when:

 a) The crank is at the dead center
 b) The crank makes an angle of 45° with the line of stroke
 c) The crank and connecting rod are collinear
 d) The crank and connecting rod are perpendicular

 21. A slider-crank mechanism operates at a constant crank angular velocity of ω. If the crank length is r and the connecting rod length is l, the maximum acceleration of the slider occurs when the crank angle is:

 a) 0°
 b) 90°
 c) 180°
 d) 270°
- 22. The comparators are used in metrology primarily for:
 - a) Magnifying the measurements
 - b) Detecting small variations in dimension
 - c) Measuring large components
 - d) Aligning the machine tools
- 23. In vibration isolation, the transmissibility ratio is less than 1 when:
 - a) $\omega/\omega_n < \sqrt{2}$
- b) $\omega/\omega_n = 0$
- c) $\omega/\omega_n = 1$
- d) $\omega/\omega_n > \sqrt{2}$
- 24. Materials Requirement Planning (MRP) primarily aims to:
 - a) Minimize inventory
 - b) Improve machine maintenance
 - c) Optimize the production schedule and inventory
 - d) Reduce labour costs
- 25. The S-N curve (Wohler curve) is used to represent:
 - a) The relationship between stress and strain
 - b) The modulus of elasticity
 - c) The fatigue strength of materials
 - d) The material toughness
- 26. When designing a shaft, the primary concern under dynamic loading is:
 - a) Torsional stress
 - b) Bending stress
 - c) Combined bending and torsion
 - d) Shear stress due to axial loading
- 27. In network flow models, a bipartite graph is commonly used to represent:
 - a) Inventory levels in supply chain models
 - b) Nodes and edges in a transportation problem
 - c) Sources and sinks in a network
 - d) Tasks and workers in an assignment problem
- 28. The primary function of a flywheel in a mechanical system is to:
 - a) Maintain a constant angular velocity
 - b) Absorb shock loads and dampen vibrations
 - c) Store rotational energy and smooth power transmission
 - d) Increase the speed of the engine

- 29. Which of the following is true about the CPM network?
 - a) The total project duration is determined by the longest path through the network
 - b) Slack time is not considered in CPM
 - c) All activities have the same duration in the CPM network
 - d) The critical path can be changed during the project execution phase
- 30. In the case of viscous flow through pipes, the head loss due to friction is primarily influenced by:
 - a) The density of the fluid
 - b) The temperature of the fluid
 - c) The velocity of the fluid and the pipe diameter
 - d) The viscosity of the fluid and the roughness of the pipe surface
- 31. In PERT, the variance of an activity is calculated using the formula:
 - a) Variance= $\{(P-O)/6\}^2$
 - b) Variance= $\{(P-O)/4\}^2$
 - c) Variance= $\{(P-O)/2\}^2$
 - d) Variance= $\{(P-O)/3\}^2$

where O is the optimistic time, and P is the pessimistic time.

- 32. The Thermal boundary layer is primarily dependent on which factor in fluid flow?
 - a) Viscosity of the fluid
 - b) Surface roughness of the boundary
 - c) Thickness of the fluid layer
 - d) Temperature difference between the solid surface and the fluid
- 33. For radiative heat transfer, black bodies are characterized by:
 - a) High emissivity and perfect absorption
 - b) High reflectivity and low emissivity
 - c) Low emissivity and perfect absorption
 - d) High emissivity and low absorption
- 34. In the Carnot cycle, which of the following statements is true?
 - a) The Carnot cycle does not involve any heat exchange with the surroundings.
 - b) The Carnot cycle is irreversible and cannot be used for real engines.
 - c) The Carnot cycle operates between two temperatures, and it is always reversible.
 - d) The Carnot cycle is a thermodynamic process where work is not done.
- 35. The work done in a reversible isothermal expansion of an ideal gas is given by:
 - a) $W = nRT \ln(V_2/V_1)$
 - b) $W = P(V_2 V_1)$
 - c) $W = nRT (V_2 V_1)$
 - d) W = 0
- 36. The riser in metal casting is designed to:
 - a) Increase the cooling rate
 - b) Speed up the cooling process of the metal
 - c) Provide a path for the molten metal to enter the mold
 - d) Prevent defects due to shrinkage during solidification
- 37. In the extrusion process, the material:
 - a) Is pulled through a die to form a continuous profile
 - b) Is hammered into the desired shape
 - c) Is compressed between two rolls
 - d) Is pressed through a mold by applying a force perpendicular to the material's surface

- 38. What is the primary purpose of quenching in heat treatment?
 - a) To improve corrosion resistance
 - b) To reduce internal stresses
 - c) To increase the hardness of the material
 - d) To remove impurities from the metal
- 39. The Yield point in the stress-strain diagram refers to:
 - a) The point at which the material fractures
 - b) The point at which plastic deformation begins
 - c) The point at which the material reaches its maximum strength
 - d) The point where the material is completely elastic
- 40. Which of the following forming processes is used for making small and intricate parts from sheet metal?
 - a) Rolling
 - b) Extrusion
 - c) Deep drawing
 - d) Punching