SET-"X"

(Total No. of printed pages : 24)

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

(PH.D/URS-EE-December-2022)

10029

Mechanical Engineering sr. No._

Time: 11/4 Hours	Total Ques	tions: 100	Max. Marks: 100
Roll No.	(in figure)		(in words)
Name :		Date of Birth:	
Father's Name:		Mother's Name:	
Date of Examination:			
(Signature of the candidate)		(Signate	ure of the Invigilator)

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MUST NOT be ticked in the Question book-let.

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Use only Black or Blue BALL POINT PEN of good quality in the OMR Answer-7.

BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LET. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.



Question No.	Questions		
1.	A ladder is resting on a smooth ground and leaning against a rough vertical wall. The force of friction will act		
34	(1) Downward at its upper end		
	(2) Upward at its upper end		
	(3) Zero at its upper end		
	(4) Perpendicular to the wall at its upper end		
2.	The acceleration of a particle with simple harmonic motion, at any instant is given by		
24 9	(1) $\omega.y$ (2) $\omega^2.y$		
-4-1	(3) ω^2/y (4) $\omega^3.y$		
3.	A particle moves in a circular path with constant speed v. The change in velocity when it traverses an angle of 120° is		
	(1) 2v (2) 2.5v		
	(3) √3v (4) 3√2v		
4.	For a 25 mm hole drilled in plates, the diameter of rivet shank should be		
	(1) 23 mm (2) 24.5 mm		
9	(3) 25 mm (4) 26 mm		
5.	A beam of triangular section is placed with its base horizontal. The maximum shear stress occurs at		
	(1) Apex of the triangle		
	(2) Mid of the height		
	(3) Centre of gravity of the triange		
1360	(4) Base of the triangle		

Question No.	Questions	
6.	Pitching of a ship exerts force on the bearings	
	(1) Perpendicular to their axis	
	(2) Along the axis of the bearings	
	(3) Plain perpendicular to the pitching	
	(4) None of the above	
7.	A compound cylinder with inner radius 5 cm and outer radius 7 cm is made by shrinking one cylinder onto the other cylinder. The junction radius is 6 cm and the junction pressure is 11 kg/cm². The maximum hoop stress developed in the inner cylinder is (1) 36 kg/cm² compression (2) 36 kg/cm² tension (3) 72 kg/cm² compression (4) 72 kg/cm² tension	
8.	A shaft was initially subjected to bending moment and then was subjected to torsion. If the magnitude of bending moment is found to be the same as that of torque, then the ratio of maximum bending stress to shear stress would be (1) 0.25 (2) 0.50 (3) 2.0 (4) 4.0	

Question	Questions Leavest be designed on the
9.	A transmission shaft subjected to bending loads must be designed on the
	basis of
	(1) Maximum normal stress theory
	(2) Maximum shear stress theory
	(3) Maximum normal stress and maximum shear stress theories
	(4) Fatigue strength
10.	Maximum shear stress in Mohr's circle is equal to
10.	(1) Radius of circle
S = 100	(2) Diameter of circle
	(3) Centre of circle from y-axis (4) Chord of circle
11.	A spring with 25 active coils cannot be accommodated within a given space. Hence 5 coils of the spring are cut. What is the stiffness of the new spring?
	(1) Same as the original spring
5	(2) 1.25 times the original spring
	3) 0, times the original spring
	4) 0.5 times the original spring
IDave	S-EE-2022 (Mechanical Engineering) Code-A

Question No.	Questions		
12.	The effective diameter of an external or internal screw thread, is known as		
	(1) Minor diameter (2) Major diameter		
	(3) Pitch diameter (4) None of these		
13.	A point on a link connecting a double slider crank chain will trace a		
	(1) Straight line (2) Circle		
	(3) Parabola (4) Ellipse		
14.	In pivot bearing, the wear at the contact area is:		
	(1) Zero at the centre (2) Uniform throughout		
	(3) Max. at the centre (4) Max. at the outer radius		
15.	An involute pinion and gear are in mesh. If both have the same size of addendum, then there will be an interference between the		
	(1) Tip of the ear tooth and flank of pinion		
	(2) Tip of pinion and flank of gear		
	(3) Flanks of both gear and pinion		
	(4) Tip of both ear and pinion		
16.	A spring controlled governor is found unstable. It can be made stable by		
	(1) Increasing the spring stiffness		
	(2) Decreasing the spring stiffness		
	(3) Increasing the ball weight		
	(4) Decreasing the ball weight		

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Question No.	Questions
17.	The point on the cam with maximum pressure angle is called
#	(1) The trace point (2) The pitch point
	(3) Cam centre (4) None of the above
18.	Best position of crank for blanking operation in a mechanical press is
	(1) Top dead centre
	(2) 20 degree below top dead centre
·	(3) 20 degress before bottom dead centre
	(4) Bottom dead centre
19.	A connecting rod has a mass of 0.5 kg, the radius of gyration through its centre of gravity is 5 cm and its acceleration is 2×10^4 rad/sec ² . The equivalent two mass system for the connecting rod has a radius of gyration 6 cm. What is the correction couple of the equivalent system?
10 42 11 14 15	(1) 11 Nm (2) 9 Nm
	(3) 6 Nm (4) 1 Nm
20.	Petroff's equation is used when journal
) · · · · ·	(1) Coincides with bearing
	(2) Is concentric with bearing
	(3) Rotates in clockwise direction
	(4) Rotates in anticlockwise direction
1	

Question No.	Questions	
21.	1. Design of shafts made of brittle materials is based on :	
	(1) Guest's theory (2) Ranine's theory	1
	(3) St. Venant's theory (4) Von Mises theory	
22.	According to Indian Boilers Regulations, the factor of safety in joint should not be less than:	riveted
	(1) 1.5 (2) 2	
€ ⊕ ²⁷ €	(3) 4 (4) 6	
23.	Miter gears are: (1) Right angled bevel gears with same number of teeth (2) Spur gears with same number of teeth (3) Helical gears with same number of teeth (4) None of the above	
24.	The bearing characteristic relating absolute viscosity of lubricant(Z of journal (N) and bearing pressure (p) is defined as :), spee
	$(1) ZN/p \qquad (2) Zp/N$	
	(3) pN/Z (4) ZpN	
25.	What is sunk key made in the form of a segment of a circular uniform thickness, known as?	disc o
	(1) Feather key (2) Kennedy key	
2.	(3) Woodruff key (4) Saddle key	

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Questi No.	on Questions ,
26.	strain rate are known as:
	(1) Rhedopectic fluids (2) Thixotropic fluid
	(3) Pseudoplastic fluid (4) Newtonian fluids
27.	The capillary rise at 20°C in clean glass tube of 1 mm diameter containing water is approximately.
	(1) 15 mm (2) 50 mm
ļ., ;	(3) 20 mm (4) 3 mm
28.	Prandtl's mixing length hypothesis is based on :
9	(1) Eddy viscosity
a fa	(2) Momentum exchange that occurs due to random motion
	(3) Similarity of turbulent flow pattern
	(4) None of the above
29.	In the case of pelton turbine installed in a hydraulic power plant, the gross head available is the vertical distance between
	(1) Forebay and tail race
	(2) Reservoir level and turbine inlet
	(3) Forebay and turbine inlet
	4) Reservoir level and tail race

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Question	Code-A
No.	Questions
30.	In a centrifugal pump when delivery value is fully closed, the pressure of
	fluid inside the pump will
	(1) Become zero (2) Reduce
	(3) Increase (4) Remain unaltered
31.	Water is flowing with a flow rate of 0.002 m³/s. What is the average velocity
	at an outlet where the area is 4 cm ² ?
	(1) 50 m/s (2) 20 m/s
3	(3) 10 m/s (4) 5 m/s
32.	In a hydraulic coupling
	(1) Slip is negligible at low speeds
	(2) Efficiency of transmission is high at low speeds
	(3) Slip is around 2 to 3 percent at the running speed
	(4) Efficiency is high as compared to mechanical coupling
33.	The magnus effect is defined as:
	(1) The generation of lift per unit drag force
	(2) The circulation induced in an aircraft wing
	(3) The separation of boundary layer near the trailing edge of a slender
	body
	(4) The generation of lift on a rotating cylinder in a uniform flow

SET-X Code-A

Questic No.			
34.	In a centrifugal compressor, the highest Mach number leading to show wave in the fluid flow occurs at		
	(1) Diffuser inlet radius (2) Diffuser outlet radius		
	(3) Impeller inlet radius (4) Impeller outlet radius		
35.	The Moody diagram is used in fluid mechanics to obtain the		
	(1) Drag coefficient (2) Strouhal number		
	(3) Friction factor (4) Manning constant		
36.	Hot oil is cooled from 80 to 50°C in an oil cooler which uses air as the coolant. The air temperature rises from 30 to 40°C. The designer uses a LMTD value of 26°C. The type of heat exchanger is		
	(1) Parallel (2) Double pipe		
	(3) Counter flow (4) Cross flow		
37.	Prandtl number has least value in which of the following?		
	(1) Gases (2) Brine solution		
	(3) Liquid metal (4) Oil film		
38.	In spite of large heat transfer coefficients in boiling liquids, fins are used advantageously when the entire surface is exposed to		
	(1) Nucleate boiling (2) Film boiling		
	(3) Transition boiling (4) All modes of boiling		

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Question No.	Questions
39 .	Fraction of radiative energy leaving one surface that strikes the other surface is called
	(1) Radiative flux (2) Emissive power of the first surface
	(3) View factor (4) Re-radiation flux
40.	In unsteady-state heat conduction for bodies with negligible temperature gradients, the time temperature variation curve is
	(1) Linear (2) Parabolic
	(3) Sinusoidal (4) Exponential
41.	A mass M of a fluid at temperature T_1 is mixed with an equal mass of the same fluid at temperature T_2 . The resultant change in entropy of the universe is
	(1) Zero (2) Negligible
	(3) Always negative (4) Always positive
42.	If methane undergoes combustion with the stoichiometric quantity of air fuel ratio on molar basis would be
	(1) 15.22:1 (2) 12.30:1
	(3) 14.56:1 (4) 9.52:1
43.	A cylinder contains 5 m ³ of ideal gas at a pressure of 1 bar. This gas is compressed in a reversible isothermal process till its pressure increases
	to 5 bar. The work in kJ is required for this process is
0 (9	(1) 804.7 (2) 953.2
	(3) 981.7 (4) 1012.2

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Question No.	Questions	
44.	Energy conversion takes place only in one row of rotor of nozzle blades and later the steam glides over the rotor and guide rows in the case of (1) De Laval turbine (2) Rateau turbine	
	(3) Parson's turbine (4) Curtis turbine	
45.	The degree of reaction of a turbine is the ratio of enthalpy drop in (1) Moving blades to enthalpy drop in the stage (2) Fixed blades to enthalpy drop in the stage (3) Moving blades to enthalpy drop in fixed blades	
	(4) Fixed blades to enthalpy drop in moving blades	
46.	A solar energy based heat engine which receives 80 kJ of heat at 100°C rejects 70 kJ of heat to the ambient at 30°C is to be design. The thermal efficiency of the heat engine is:	
	(1) 70% (2) 1.88% (3) 12.5% (4) Indeterminate	
47.	Which phenomena have the most adverse effect on volumetric efficiency when engine works at high speeds?	
	(1) Flow friction and choking	
	(2) Ram effect and choking	
	(3) Flow friction and charge heating	
	(4) Charge heating and back flow	
	Fringering) Code-A	

uestion No.	Questions				
48.	In the Rankine cycle, lower limit on the condenser pressure is due to the				
	(1) Expansion limit in turbine				
	(2) Condenser size				
	(3) Air leakage into the condenser				
-	(4) Temperature of cooling water				
49.	Efficiency of nozzle governed turbine is affected mainly by losses to				
	(1) Partial admission (2) Throttling				
	(3) Interstage pressure drop (4) Condensation in last				
50.	lower temperature increases (1) COP increases (2) COP decreases (3) Power consumption increases (4) Heat transfer during isothermal process decreases				
	 (1) Draw out the material (2) Bend the material (3) Upset the material (4) Extrude the material 				
PHI	O/URS-EE-2022 (Mechanical Engineering) Code-A				

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	Coue-7		
Question No.	Questions		
52.	A spherical drop of molten metal of radius 2 mm was found to solidify 10 seconds. A similar drop of radius 4 mm would solidify in:		
0	(1) 14.14 seconds (2) 20 seconds		
	(3) 18.30 seconds (4) 40 seconds		
53.	Directional solidification in castings can be improved by using:		
	(1) Chills and chaplets (2) Chills and padding		
8	(3) Chaplets and padding (4) Chills, chaplets and padding		
54.	Preheating before welding is done to:		
	(1) Make the steel softer		
5 e %	(2) Burn away oil, grease etc. from the plate surface		
2.10	(3) Prevent cold cracks		
	(4) Prevent plate distortion		
55.	Which one of the following sets of forces are encountered by a lathe parting		
	tool while groove cutting		
	(1) Tangential, radial and axial		
	(2) Tangential and radial		
	(3) Tangential and axial		
	(4) Radial and axial		
	·		

uestion	Questions			
No. 56.	Poor machinability of centrifugally cast iron pipe is due to:			
		(2) Segregation		
	(3) Dense structure	(4) High mould rotation speed		
57.	A single short thread of pitch 2 mm is to be produced on a lathe having a lead screw with a double start thread of pitch 4 mm. The ratio of speeds between the spindle and lead screw for this operation is:			
	(1) 1:2	(2) 2:1		
	(3) 1:4	(4) 4 :1		
58.	Crater wear is predominant in:			
	(1) Carbon steel tools	(2) Tungsten carbide tools		
	(3) High speed steel tools	(4) Ceramic tools		
59.	A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend?			
	(1) Grinding	(2) Rough Turning		
.W 20	(3) Lapping	(4) Honing		
60.	at 200 rpm is used to remove a	er of 100 mm diameter and 10 teeth rotating layer of 3 mm thickness from a steel bar. te, the feed per tooth in this operation will		
	(1) 0.2 mm	(2) 0.4 mm		
	(b) 0.0 mm	(4) 0.6 mm		
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Question No.	Questions
61.	The white aluminium oxide is denoted by:
	(1) Al (2) A
9	(3) WA (4) WAL
62.	The length of approach in case of drilling operation is equal to:
	(1) 0.8 D (2) 0.6 D
KOM 5	(3) 0.29 D (4) 0.14 D
63.	In chemical milling process, the chemical reagent for steel work piece is
	(1) Nitric acid (2) Sodium sulphate
ì	(3) Caustic soda (4) Sodium chloride
64.	The numerical control machines are controlled by the tape whose width is
22	(1) 50 mm (2) 40 mm
_	(3) 30 mm (4) 20 mm
65.	High speed steel tools retail their hardness upto a temperature of:
	(1) 1400°C (2) 1200°C
	(3) 900°C (4) 500°C
66.	The floating position of the holding fixture in a rotary transfer device is
-	used to:
- 1	(1) Improve the accuracy of location
	(2) Reduce the tendency to cover-index
	3) Improve upon the acceleration and deceleration characteristics
(4) Reduce the cycle time

Questio				
No. 67.	Gear burnishing is a process for: (1) Surface finishing (2) Undercut gears (3) Cycloidal gears (4) Removing residual stresses from teeth roots			
68.	During a single pass rolling processes, the thickness of metallic sheet is reduced from 18 mm to 12 mm. Roll diameter is 500 mm. Angle of bite is degrees is (1) 5.24 (2) 4.79			
	(3) 8.83 (4) 6.68			
69.	A commonly used 30 mm H-hole with tolerance grade IT9 is expressed a			
	(1) 30IT9 (2) 30HIT9			
	(3) 30H9 (4) 9H30			
70.	Stellite is a non ferrous cast alloy composed of			
	(1) Cobalt, Chromium and Tungsten			
	(2) Tungsten, Chromium and Vanadium			
	(3) Molybdenum, Tungsten and Chromium			
(4) Tungsten, Chromium, Molybdenum and Vanadium			

	Coue-A
Questio No.	Questions
71.	In the 3-2-1 principle of fixture design, 3 refers to number of
	(1) Setup possible (2) Clamps required
	(3) Positions on primary face (4) Locating positions
72.	For resistance spot welding of 2.0 mm thick steel sheets, the current required is of the order of
	(1) 10 A (2) 100 A
	(3) 1000 A (4) 10,000 A
73.	The ratio of surface area to volume for a unit volume of riser is minimum in case of
	(1) Cylindrical riser (2) Spherical riser
4	(3) Hemispherical riser (4) Cuboids riser
74.	Which of the following cutting tool bits are made by powder metallurgy process
	(1) Carbon steel bits (2) Stellite tool bits
	(3) Ceramic tool bits (4) All of the above
75.	For drilling aluminium, a drill with
- 1	(1) High helix angle is required
	(2) Low helix angle is required
	3) Any helix angle can be used
	4) Zero helix angle is required
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Question No.	Questions
76.	In Optiz code, the first five digits express
	(1) Production operation type and sequence
	(2) Attributes which are used for manufacturing
	(3) Primary design attributes of the part
	(4) None of these
77.	The probability distribution of project completion in PERT flows following
	distribution:
	(1) Normal (2) Binomial
	(3) Beta (4) Gaussian
78.	From the point of motion economy it is preferable to move:
LI SP	(1) Both hands in the same direction
	(2) Right hand first and then the left hand
	(3) Only one hand at a time
	(4) Both hands in opposite direction
79.	A device used for lifting or lowering objects suspended from a hook at the
	end of retractable chains or cable is called
	(1) Hoist (2) Job crane
	(3) Portable elevator (4) Chain conveyor
20	

	A. A. C.	Code-A
Question No.	Questi	ons
80.	A diagram showing the path follows a task is known as: (1) String diagram (2) (3) Travel chart (4)	
81.	Forecasting which assumes a state (1) Passive forecasting (2) (3) Long term forecasting (4)	Active forecasting
82.	In production, planning and cont start of an operation on the shop (1) Dispatch order (2) (3) Loading chart (4)) Route plan
83.	In a study to estimate the idle observations the machine is found observations for 95% confidence left (1) 384 (2) (3) 2400 (4)	600
84.		tage of time saved ?
	(1) Hasley plan (2)	Emerson plan
	(3) Haynes plan (4)	Gnatt plan

Question No.	Questions		
85.	The most traditional and most often used work measurement technique is: (1) Time study-stop watch (2) Work sampling		
	(1) Time study-stop watch (2) Work samples (3) Analytical estimating (4) Pre-determined motion time system		
86.	Amortization means: (1) Liquidation of financial obligations (2) Liquidation of an industry (3) Commitment of financial obligations (4) Liquidation of financial obligations on the indeterminable		
87.	In simplest method, the row to be replaced (1) Zero (2) Less than zero (3) More than zero (4) Infinity		
88.	Given set of vectors (2, 3, -1), (1, 7, -2) and (3, 5, 2) in R³ is (1) Linearly dependent over R³ (2) Linearly independent over R³ (3) Will form a matrix with all zero solutions (4) System has no solution		
89.	Suppose rank of a matrix A _(7×8) is 6, then which of the following is correct (1) A is invertible matrix (2) A is skew-symmetric matrix (3) A has fifteen linear independent solutions (4) A will have six linearly independent rows and column		

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Question No.	Questions			
90.	Which one of the following is not a technique of PMTS?			
	(1) Synthetic data (2) Stop-watch time study			
	(3) Work factor (4) MTM			
91.	In inventory planning, extra inventory is unnecessarily carried to the end of the planning period when using one of the following lot size decision policies:			
	(1) Lot-for-lot production (2) EOQ lot size			
	(3) Period order quantity (4) Part period total cost balancing			
92.	Dummy activities are used in a network to:			
y v v	(1) Facilitate computation of slacks			
* 3	(2) Satisfy precedence requirements			
	(3) Determine project completion time			
	(4) Avoid use of resource			
93.	If the value of variance is more :			
	(1) Certainty is more			
	(2) Probability of certainty is more			
	(3) Uncertainty is more			
	(4) Probability distribution curve shall be having a unsymmetrical shape			

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Question No.	Questions			
94.	Bucket is a term used in MRP systems, it is a			
	(1) Principal unit of time measurement(2) Demand for a raw material			
	(3) Product mix	2		
	(4) Material in hand			
95.	The probability law that	t determin	es the fluctuations of fraction defective	
	is o			
	(1) Poisson	(2)	Normal	
	(3) Binomial	(4)	Exponential	
96.	In value engineering "worth" is value of			
	(1) Product	(2)	Service	
	(3) System	(4)	Function	
97.	Which of the following re	epresents t	the reduction in duration ?	
	(1) Crushing	(2)	Negative slack	
	(3) Variance	(4)	All of the above	
98.	For a skew-symmetric matrix, minimum possible rank is:			
	(1) 0	(2)	1	
	(1) 0(3) Greater than 1	(4)	2	

Question No.		Questions		
99.	Deg	Degeneracy in LPP method indicates		
	(1)	Tie for key column	(2)	Tie for key row
	(3)	Infeasible problem	(4)	Multiple optional solutions
100.	Programmable Logic Controller is used for applications like			
	(1)	On/Off control	(2)	Timing
	(3)	Counting and sequencing	(4)	All of the above
* E				
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SET-X Code-B

	Coue-D	
Question No.	Questions	
1.	A mass M of a fluid at temperature T ₁ is mixed with an equal mass of the same fluid at temperature T ₂ . The resultant change in entropy of the universe is	
	(1) Zero (2) Negligible	
	(3) Always negative (4) Always positive	
2.	If methane undergoes combustion with the stoichiometric quantity of air fuel ratio on molar basis would be	
	(1) 15.22:1 (2) 12.30:1	
-	(3) 14.56:1 (4) 9.52:1	
3.	A cylinder contains 5 m ³ of ideal gas at a pressure of 1 bar. This gas is compressed in a reversible isothermal process till its pressure increases to 5 bar. The work in kJ is required for this process is (1) 804.7 (2) 953.2	
	(3) 981.7 (4) 1012.2	
4.	Energy conversion takes place only in one row of rotor of nozzle blades and later the steam glides over the rotor and guide rows in the case of	
	(1) De Laval turbine (2) Rateau turbine	
	(3) Parson's turbine (4) Curtis turbine	
5.	The degree of reaction of a turbine is the ratio of enthalpy drop in	
	(1) Moving blades to enthalpy drop in the stage	
.	(2) Fixed blades to enthalpy drop in the stage	
- 1	(3) Moving blades to enthalpy drop in fixed blades	
1	- 111 1	
	(4) Fixed blades to enthalpy drop in moving blade	

SET-X Code-B

Question No.	Questions
6.	A solar energy based heat engine which receives 80 kJ of heat at 100°C and rejects 70 kJ of heat to the ambient at 30°C is to be designed. The thermal efficiency of the heat engine is:
*	(1) 70% (2) 1.88%
	(3) 12.5% (4) Indeterminate
7.	Which phenomena have the most adverse effect on volumetric efficiency when engine works at high speeds?
,	(1) Flow friction and choking
	(2) Ram effect and choking
	(3) Flow friction and charge heating
1	(4) Charge heating and back flow
8.	In the Rankine cycle, lower limit on the condenser pressure is due to the
F × =	(1) Expansion limit in turbine
•	(2) Condenser size
	(3) Air leakage into the condenser
	(4) Temperature of cooling water
9.	Efficiency of nozzle governed turbine is affected mainly by losses to
	(1) Partial admission (2) Throttling
	(3) Interstage pressure drop (4) Condensation in last
	•

	Code-D
Question No.	Questions
10.	In a Carnot refrigeration cycle, for constant upper temperature T_h , as the lower temperature increases
6	(1) COP increases
	(2) COP decreases
	(3) Power consumption increases
	(4) Heat transfer during isothermal process decreases
11.	In the 3-2-1 principle of fixture design, 3 refers to number of
	(1) Setup possible (2) Clamps required
	(3) Positions on primary face (4) Locating positions
12.	For resistance spot welding of 2.0 mm thick steel sheets, the current required is of the order of
	(1) 10 A (2) 100 A
	(3) 1000 A (4) 10,000 A
13.	The ratio of surface area to volume for a unit volume of riser is minimum in case of
	(1) Cylindrical riser (2) Spherical riser
	(3) Hemispherical riser (4) Cuboids riser
	Which of the following cutting tool bits are made by powder metallurgy process
	(1) Carbon steel bits (2) Stellite tool bits
	(3) Ceramic tool bits (4) All of the above
TTD (TTT	of FF 2022 (M. 1 - rical Engineering) Code-B

SET-X Code-B

	Oue-B
Question No.	Questions
15.	For drilling aluminium, a drill with
	(1) High helix angle is required
L.	(2) Low helix angle is required
	(3) Any helix angle can be used
	(4) Zero helix angle is required
16.	In Optiz code, the first five digits express
	(1) Production operation type and sequence
4	(2) Attributes which are used for manufacturing
	(3) Primary design attributes of the part
	(4) None of these
17.	The probability distribution of project completion in PERT flows followin distribution:
	(1) Normal (2) Binomial
	(3) Beta (4) Gaussian
18.	From the point of motion economy it is preferable to move:
	(1) Both hands in the same direction
	(2) Right hand first and then the left hand
	(3) Only one hand at a time
	D. I. I. J. in amposite direction
	(4) Both hands in opposite direction

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Question No.	Questions	
19.	A device used for lifting or lowering objects suspended from end of retractable chains or cable is called	a hook at the
	(1) Hoist (2) Job crane	٠,
	(3) Portable elevator (4) Chain conveyor	17
20.	A diagram showing the path followed by men and materials wh	ile performin
	a task is known as:	
	(1) String diagram (2) Flow process chart	
	(3) Travel chart (4) Flow diagram	
21.	In inventory planning, extra inventory is unnecessarily carr of the planning period when using one of the following lot	ried to the end
	policies:	
	(1) Lot-for-lot production (2) EOQ lot size	
G.	(3) Period order quantity (4) Part period total cost ba	lancing
22.	Dummy activities are used in a network to:	
	(1) Facilitate computation of slacks	
	(2) Satisfy precedence requirements	
-	(3) Determine project completion time	
	(4) Avoid use of resource	
	ical Engineering) Code-B	

No.	Questions
23.	If the value of variance is more:
	(1) Certainty is more
	(2) Probability of certainty is more
	(3) Uncertainty is more
	(4) Probability distribution curve shall be having a unsymmetrical shape
24.	Bucket is a term used in MRP systems, it is a
	(1) Principal unit of time measurement
	(2) Demand for a raw material
Stall	(3) Product mix
	(4) Material in hand
25.	The probability law that determines the fluctuations of fraction defective
*	is a second defective
	(1) Poisson (2) Normal
	(3) Binomial (4) Exponential
26.	In value engineering "worth" is value of
	(1) Product (2) Service
	(3) System (4) Function
рип/п	RS-EE-2022 (Mechanical Engineering) Code-B

Question No.	Questions	
27.	Which of the following represents the reduction in duration?	
1	(1) Crushing (2) Negative slack	
	(3) Variance (4) All of the above	
28.	For a skew-symmetric matrix, minimum possible rank is:	
	(1) 0 (2) 1	
	(3) Greater than 1 (4) 2	
29.	Degeneracy in LPP method indicates	
	(1) Tie for key column (2) Tie for key row	
	(3) Infeasible problem (4) Multiple optional solutions	
30.	Programmable Logic Controller is used for applications like	
	(1) On/Off control (2) Timing	
	(3) Counting and sequencing (4) All of the above	
31.	A ladder is resting on a smooth ground and leaning against a rough vertical wall. The force of friction will act	
	(1) Downward at its upper end	
	(2) Upward at its upper end	
	(3) Zero at its upper end	
i	(4) Perpendicular to the wall at its upper end	
РИВ/П	RS-EF 2022 (Machanical Engineering) Code-B	

Question No.	Questions	
32.	The acceleration of a particle with simple harmonic motion, at any instant is given by	
	(1) $\omega.y$ (2) $\omega^2.y$	
	(3) ω^2/y (4) $\omega^3.y$	
33.	A particle moves in a circular path with constant speed v. The change in velocity when it traverses an angle of 120° is	
	(1) 2v (2) 2.5v	
	(3) $\sqrt{3}v$ (4) $3\sqrt{2}v$	
34.	For a 25 mm hole drilled in plates, the diameter of rivet shank should be	
	(1) $23 \mathrm{mm}$ (2) $24.5 \mathrm{mm}$	
	(3) 25 mm (4) 26 mm	
35.	A beam of triangular section is placed with its base horizontal. The maximum shear stress occurs at	
	(1) Apex of the triangle	
	(2) Mid of the height	
	(3) Centre of gravity of the triange	
	(4) Base of the triangle	
36.	Pitching of a ship exerts force on the bearings	
	(1) Perpendicular to their axis	
	(2) Along the axis of the bearings	
	(3) Plain perpendicular to the pitching	
	(4) None of the above	

Question No.	Questions	
37.	A compound cylinder with inner radius 5 cm and outer radius 7 cm is made by shrinking one cylinder onto the other cylinder. The junction radius is 6 cm and the junction pressure is 11 kg/cm ² . The maximum hoop stress developed in the inner cylinder is	
	(1) 36 kg/cm ² compression	
	(2) 36 kg/cm ² tension	
	(3) 72 kg/cm ² compression	
	(4) 72 kg/cm ² tension	
38.	A shaft was initially subjected to bending moment and then was subject	
	to torsion. If the magnitude of bending moment is found to be the same as	
	that of torque, then the ratio of maximum bending stress to shear stress	
	would be	
	(1) 0.25 (2) 0.50	
•	(3) 2.0 (4) 4.0	
39.	A transmission shaft subjected to bending loads must be designed on the basis of	
	(1) Maximum normal stress theory	
	(2) Maximum shear stress theory	
	(3) Maximum normal stress and maximum shear stress theories	
	(4) Fatigue strength	

Question No.	Questions
40.	Maximum shear stress in Mohr's circle is equal to
	(1) Radius of circle
	(2) Diameter of circle
	(3) Centre of circle from y-axis
	(4) Chord of circle
41.	In the forging operation, fullering is done to:
	(1) Draw out the material
	(2) Bend the material
e 35 ()	(3) Upset the material
37	(4) Extrude the material
42.	A spherical drop of molten metal of radius 2 mm was found to solidify in 10 seconds. A similar drop of radius 4 mm would solidify in :
	(1) 14.14 seconds (2) 20 seconds
	(3) 18.30 seconds (4) 40 seconds
43.	Directional solidification in castings can be improved by using:
	(1) Chills and chaplets (2) Chills and padding
	(3) Chaplets and padding (4) Chills, chaplets and padding

Question No.	Questions
44.	Preheating before welding is done to: (1) Make the steel softer (2) Burn away oil, grease etc. from the plate surface
To same	(3) Prevent cold cracks (4) Prevent plate distortion
45.	Which one of the following sets of forces are encountered by a lathe parting tool while groove cutting (1) Tangential, radial and axial (2) Tangential and radial (3) Tangential and axial (4) Radial and axial
46.	Poor machinability of centrifugally cast iron pipe is due to: (1) Chilling (2) Segregation (3) Dense structure (4) High mould rotation speed
	A single short thread of pitch 2 mm is to be produced on a lathe having a lead screw with a double start thread of pitch 4 mm. The ratio of speeds between the spindle and lead screw for this operation is: (1) 1:2 (2) 2:1 (3) 1:4 (4) 4:1

X - . 38

estion No.	Questions
48.	Crater wear is predominant in:
	(1) Carbon steel tools (2) Tungsten carbide tools
a a	(3) High speed steel tools (4) Ceramic tools
49.	A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend?
1. 100000	(1) Grinding (2) Rough Turning
FF 1855	(3) Lapping (4) Honing
50.	A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar. If the table feed is 400 mm/minute, the feed per tooth in this operation will be:
	(1) 0.2 mm (2) 0.4 mm
	(3) 0.5 mm (4) 0.6 mm
51.	The white aluminium oxide is denoted by:
	(1) Al (2) A
	(3) WA (4) WAL
52.	The length of approach in case of drilling operation is equal to:
	(1) 0.8 D (2) 0.6 D
	(3) 0.29 D (4) 0.14 D
53	. In chemical milling process, the chemical reagent for steel work piece is:
	(1) Nitric acid (2) Sodium sulphate
	(3) Caustic soda (4) Sodium chloride
PHD	O/URS-EE-2022 (Mechanical Engineering) Code-B

Questio No.	Questions			
54.	The numerical control machines are controlled by the tape whose width is			
	(1) 50 mm (2) 40 mm			
	(3) 30 mm (4) 20 mm			
55.	High speed steel tools retail their hardness upto a temperature of:			
	(1) 1400°C			
	(2) 1200°C			
))	(3) 900°C			
	(4) 500°C			
	The floating position of the holding fixture in a rotary transfer device used to: (1) Improve the accuracy of location			
	(2) Reduce the tendency to cover-index			
	(3) Improve upon the acceleration and deceleration characteristics			
	(4) Reduce the cycle time			
57.	Gear burnishing is a process for:			
	(1) Surface finishing			
	(2) Undercut gears			
	(3) Cycloidal gears			
(4) Removing residual stresses from teeth roots			
1				

PHD/URS-EE-2022 (Mechanical Engineering) Code-B

(13)

	Questions		
58.	During a single pass rolling processes, the thickness of metallic sheet is reduced from 18 mm to 12 mm. Roll diameter is 500 mm. Angle of bite in degrees is (1) 5.24 (2) 4.79 (3) 8.83 (4) 6.68		
59.	A commonly used 30 mm H-hole with tolerance grade IT9 is expressed as		
	(1) 30IT9 (2) 30HIT9		
	(3) 30H9 (4) 9H30		
60.	Stellite is a non ferrous cast alloy composed of (1) Cobalt, Chromium and Tungsten (2) Tungsten, Chromium and Vanadium (3) Molybdenum, Tungsten and Chromium (4) Tungsten, Chromium, Molybdenum and Vanadium		
61.	Design of shafts made of brittle materials is based on:		
	(1) Guest's theory (2) Ranine's theory		
	(3) St. Venant's theory (4) Von Mises theory		
62.	According to Indian Boilers Regulations, the factor of safety in riveted joint should not be less than:		
	(1) 1.5 (2) 2		

C1	V.		oae-B
Question No.			
63.	Miter gears are:		
	(1) Right angled bevel gears w	with same number of teeth	
	(2) Spur gears with same num	mber of teeth	
	(3) Helical gears with same nu	number of teeth	
	(4) None of the above		
64.	The bearing characteristic relat of journal (N) and bearing pres	ating absolute viscosity of lubrica essure (p) is defined as :	nt(Z), speed
	(1) ZN/p	(2) Zp/N	
	(3) pN/Z	(4) ZpN	
65.	What is sunk key made in the form of a segment of a circular duniform thickness, known as?		
e ed	(1) Feather key	(2) Kennedy key	
1 4 40	(3) Woodruff key	(4) Saddle key	
66.	Fluids that require a gradually in strain rate are known as:	increasing shear stress to mainta	in a constan
	(1) Rhedopectic fluids	(2) Thixotropic fluid	
	(3) Pseudoplastic fluid	(4) Newtonian fluids	
67.	The capillary rise at 20°C in cle	lean glass tube of 1 mm diamete	r containing
	water is approximately.		
	(1) 15 mm	(2) 50 mm	
	(3) 20 mm	(4) 3 mm	

PHD/URS-EE-2022 (Mechanical Engineering) Code-B (15)

	Code-B
Question No.	Questions
68.	Prandtl's mixing length hypothesis is based on:
	(1) Eddy viscosity
	(2) Momentum exchange that occurs due to random motion
	(3) Similarity of turbulent flow pattern
	(4) None of the above
69.	In the case of pelton turbine installed in a hydraulic power plant, the gross head available is the vertical distance between
	(1) Forebay and tail race
	(2) Reservoir level and turbine inlet
verify.	(3) Forebay and turbine inlet
	(4) Reservoir level and tail race
	In a centrifugal pump when delivery value is fully closed, the pressure of fluid inside the pump will
1	(1) Become zero (2) Reduce
	(3) Increase (4) Remain unaltered
71.	A spring with 25 active coils cannot be accommodated within a given space. Hence 5 coils of the spring are cut. What is the stiffness of the new spring?
(1) Same as the original spring
(2) 1.25 times the original spring
(3	3) 0. times the original spring
(4	1) 0.5 times the original spring

	Code-B	
Question	Questions	
No. 72.	The effective diameter of an external or internal screw thread, is known as	
	(1) Minor diameter (2) Major diameter	
	(3) Pitch diameter (4) None of these	
73.	A point on a link connecting a double slider crank chain will trace a	
	(1) Straight line (2) Circle	
	(3) Parabola (4) Ellipse	
74.	In pivot bearing, the wear at the contact area is:	
	(1) Zero at the centre (2) Uniform throughout	
	(3) Max. at the centre (4) Max. at the outer radius	
75.	An involute pinion and gear are in mesh. If both have the same size addendum, then there will be an interference between the	
, 4	(1) Tip of the ear tooth and flank of pinion	
	(2) Tip of pinion and flank of gear	
	(3) Flanks of both gear and pinion	
	(4) Tip of both ear and pinion	
76.	A spring controlled governor is found unstable. It can be made stable by	
	(1) Increasing the spring stiffness	
	(2) Decreasing the spring stiffness	
	(3) Increasing the ball weight	
	(4) Decreasing the ball weight	

PHD/URS-EE-2022 (Mechanical Engineering) Code-B (17)

Questions)		
The point on the cam with maximum pressure angle is called		
(1) The trace point (2) The pitch point		
(3) Cam centre (4) None of the above		
Best position of crank for blanking operation in a mechanical press is		
(1) Top dead centre		
(2) 20 degree below top dead centre		
(3) 20 degress before bottom dead centre		
(4) Bottom dead centre		
A connecting rod has a mass of 0.5 kg, the radius of gyration through its centre of gravity is 5 cm and its acceleration is 2×10^4 rad/sec ² . The equivalent two mass system for the connecting rod has a radius of gyration 6 cm. What is the correction couple of the equivalent system?		
(1) 11 Nm (2) 9 Nm		
(3) 6 Nm (4) 1 Nm		
Petroff's equation is used when journal		
(1) Coincides with bearing		
(2) Is concentric with bearing		
(3) Rotates in clockwise direction		
(4) Rotates in anticlockwise direction		
RS-EE-2022 (Mechanical Engineering) Code-B (18)		

SET-X Code-B

-	Code-B		
Question No.	Questions		
81.	Forecasting which assumes a static environment in the future is:		
	(1) Passive forecasting (2) Active forecasting		
	(3) Long term forecasting (4) Short term forecasting		
82.	In production, planning and control, the document which authorizes the start of an operation on the shop floor is the :		
	(1) Dispatch order (2) Route plan		
,	(3) Loading chart (4) Schedule		
83.	In a study to estimate the idle time of a machine, out of 100 random observations the machine is found idle on 40 observations. The total random observations for 95% confidence level and \pm 5% accuracy are :		
	(1) 384 (2) 600		
	(3) 2400 (4) 9600		
84.	Which of the following wage incentive plan guarantees minimum wage and bonus is paid for the fixed percentage of time saved?		
	(1) Hasley plan (2) Emerson plan		
	(3) Haynes plan (4) Gnatt plan		
85.	The most traditional and most often used work measurement technique is:		
	(1) Time study-stop watch (2) Work sampling		
	(3) Analytical estimating (4) Pre-determined motion time system		

PHD/URS-EE-2022 (Mechanical Engineering) Code-B (19)

Question No.	Questions		
86.	Amortization means:		
3	(1) Liquidation of financial obligations		
	(2) Liquidation of an industry		
	(3) Commitment of financial obligations		
	(4) Liquidation of financial obligations on the indeterminable		
87.	In simplest method, the row to be replaced		
1	(1) Zero (2) Less than zero		
ř	(3) More than zero (4) Infinity		
88.	Given set of vectors $(2, 3, -1)$, $(1, 7, -2)$ and $(3, 5, 2)$ in \mathbb{R}^3 is		
12	(1) Linearly dependent over R ³		
	(2) Linearly independent over R ³		
	(3) Will form a matrix with all zero solutions		
	(4) System has no solution		
89.	Suppose rank of a matrix A _(7×8) is 6, then which of the following is correct		
	(1) A is invertible matrix		
	(2) A is skew-symmetric matrix		
	(3) A has fifteen linear independent solutions		
	(4) A will have six linearly independent rows and column		
90.	Which one of the following is not a technique of PMTS?		
	(1) Synthetic data (2) Stop-watch time study		
	(3) Work factor (4) MTM		
TID/III	DC FE-2022 (Mechanical Engineering) Code-R		

	Code-B
·	Questions
Question No.	with a flow rate of 0.002 m ³ /s. What is the average velocity
91.	Water is flowing water where the area is 4 cm ² ?
	(2) 20 m/s
-	(3) 10 m/s
09	In a hydraulic coupling
92.	(1) Slip is negligible at low speeds
	(2) Efficiency of transmission is high at low speeds
_ =	(3) Slip is around 2 to 3 percent at the running speed
	(4) Efficiency is high as compared to mechanical coupling
93.	The magnus effect is defined as:
	(1) The generation of lift per unit drag force
	(2) The circulation induced in an aircraft wing
	(3) The separation of boundary layer near the trailing edge of a slender
	body (4) The generation of lift on a rotating cylinder in a uniform flow
94.	In a centrifugal compressor, the highest Mach number leading to shock
	wave in the fluid flow occurs at
	(1) Diffuser inlet radius (2) Diffuser outlet radius
PHD/III	(3) Impeller inlet radius (4) Impeller outlet radius (5) EE-2022 (Mechanical Engineering) Code-B
TU/UK	S-EE-2022 (Mechanical Eligination (21)

Question No.

100.

Questic No.	Questions		
95.	The Moody diagram is used in fluid mechanics to obtain the		
	(1) Drag coefficient (2) Strouhal number		
	(3) Friction factor (4) Manning constant		
96.	Hot oil is cooled from 80 to 50°C in an oil cooler which uses air as the coolant. The air temperature rises from 30 to 40°C. The designer uses a LMTD value of 26°C. The type of heat exchanger is		
	E TO CONTROL OF STATES AND STATES		
	change wal to double it restricts		
	(3) Counterflow (4) Cross flow		
97.	Prandtl number has least value in which of the following?		
	(1) Gases (2) Brine solution		
	(3) Liquid metal (4) Oil film		
98.	In spite of large heat transfer coefficients in boiling liquids, fins are use advantageously when the entire surface is exposed to		
	(1) Nucleate boiling (2) Film boiling		
(3) Transition boiling (4) All modes of boiling		
9. I	raction of radiative energy leaving one surface that strikes the other		
(1) Radiative flux (2) Emissive power of the first surface		
(3	View factor (4) Re-radiation flux		

PHD

Question No.		Questions
100.	In unsteady-state heat conduction for bodies with negligible temperature gradients, the time temperature variation curve is	
	(1) Linear	(2) Parabolic
	(3) Sinusoida	d (4) Exponential
	a a	5.
	e e	

SET-"X"

(Total No. of printed pages : 24)

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

(PH.D/URS-EE-December-2022)

Mechanical Engineering Sr. No. 10027

Fime: 1¼ Hours	Total Ques		Max. Marks : 100 (in words)
Roll No Name :	(111 1-6 1 /	Date of Birth:	
Father's Name :		Mother's Nam	ne:
Date of Examination:			
(Signature of the candida	ite)	(Sign	ature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

All questions are compulsory.

The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by

the candidate.

Question Booklet along-with answer key of all the A,B,C and D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will considered.

The candidate MUST NOT do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers

MUST NOT be ticked in the Question book-let.

There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.

Use only Black or Blue BALL POINT PEN of good quality in the OMR Answer-7.

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Question No.	Questions
1.	Design of shafts made of brittle materials is based on: (1) Guest's theory (2) Ranine's theory
	(3) St. Venant's theory (4) Von Mises theory
2.	According to Indian Boilers Regulations, the factor of safety in riveted joint should not be less than:
	(1) 1.5 (2) 2
	(3) 4
3.	Miter gears are:
1	(1) Right angled bevel gears with same number of teeth
	(2) Spur gears with same number of teeth
	(3) Helical gears with same number of teeth
	(4) None of the above
4.	The bearing characteristic relating absolute viscosity of lubricant(Z), speed of journal (N) and bearing pressure (p) is defined as:
The Britis 1	(1) ZN/p (2) Zp/N
94.71	(3) pN/Z (4) ZpN
5.	What is sunk key made in the form of a segment of a circular disc of uniform thickness, known as?
	(1) Feather key (2) Kennedy key
	(3) Woodruff key (4) Saddle key

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (1)

Questic No.	Questions	Опектоп
6.	Fluids that require a gradually increasing shear stress to maintastrain rate are known as: (1) Rhedopectic fluids (2) Thixotropic fluid	
davin	(3) Pseudoplastic fluid (4) Newtonian fluids	4 9
7.	The capillary rise at 20°C in clean glass tube of 1 mm diameter water is approximately.	er containing
	(1) 15 mm (2) 50 mm	
	(3) 20 mm (4) 3 mm	
8.	Prandtl's mixing length hypothesis is based on: (1) Eddy viscosity (2) Momentum exchange that occurs due to random motion (3) Similarity of turbulent flow pattern (4) None of the above	T B
9.	In the case of pelton turbine installed in a hydraulic power placed available is the vertical distance between	V-1
1 1	 Forebay and tail race Reservoir level and turbine inlet Forebay and turbine inlet Reservoir level and tail race 	e e

PHD/URS-EE-2022 (Mechanical Engineering) Code-C

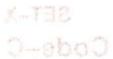
SET-X Code-C

Question No.	Questions
10.	In a centrifugal pump when delivery value is fully closed, the pressure of fluid inside the pump will
	(1) Become zero (2); Reduce in Introduction (3) Increase (4) Remain unaltered (5)
11.	In the forging operation, fullering is done to: (1) Draw out the material (2) Bend the material (3) Upset the material (4) Extrude the material
12.	A spherical drop of molten metal of radius 2 mm was found to solidify in 10 seconds. A similar drop of radius 4 mm would solidify in: (1) 14.14 seconds (2) 20 seconds (3) 18.30 seconds (4) 40 seconds
13.	Directional solidification in castings can be improved by using: (1) Chills and chaplets (2) Chills and padding (3) Chaplets and padding (4) Chills, chaplets and padding
14.	Preheating before welding is done to: (1) Make the steel softer (2) Burn away oil, grease etc. from the plate surface (3) Prevent cold cracks (4) Prevent plate distortion (IDS FF 2002 (Machanical Engineering) Code-C

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (3)

Question No.	Questions				
15.	Which one of the following sets of forces are encountered by a lathe parting tool while groove cutting (1) Tangential, radial and axial (2) Tangential and radial (3) Tangential and axial (4) Radial and axial				
16.	Poor machinability of centrifugally cast iron pipe is due to: (1) Chilling (2) Segregation (3) Dense structure (4) High mould rotation speed				
17.	A single short thread of pitch 2 mm is to be produced on a lathe having a lead screw with a double start thread of pitch 4 mm. The ratio of speeds between the spindle and lead screw for this operation is: (1) 1:2 (2) 2:1 (3) 1:4 (4) 4:1				
18.	Crater wear is predominant in: (1) Carbon steel tools (2) Tungsten carbide tools (3) High speed steel tools (4) Ceramic tools				
19.	A surface finish of 0.025-0.1 micrometer CLA values to be produced Which machining process would you recommend? (1) Grinding (2) Rough Turning (3) Lapping (4) Honing				

PHD/URS-EE-2022 (Mechanical Engineering) Code-C



Question No.	Questions A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar. If the table feed is 400 mm/minute, the feed per tooth in this operation will				
20.					
n de 1 v	be: The second will be seed to the second of				
A.**	(1) 0.2 mm (2) 0.4 mm				
	(3) 0.5 mm (4) 0.6 mm				
21.	Forecasting which assumes a static environment in the future is:				
	(1) Passive forecasting (2) Active forecasting				
	(3) Long term forecasting (4) Short term forecasting				
22.	In production, planning and control, the document which authorizes the start of an operation on the shop floor is the :				
,	(1) Dispatch order (2) Route plan				
	(3) Loading chart (4) Schedule				
23.	In a study to estimate the idle time of a machine, out of 100 random observations the machine is found idle on 40 observations. The total random observations for 95% confidence level and \pm 5% accuracy are :				
	(1) 384 (2) 600				
eram si	(3) 2400 (4) 9600				
24.	Which of the following wage incentive plan guarantees minimum wage and bonus is paid for the fixed percentage of time saved?				
	(1) Hasley plan (2) Emerson plan				
	(1) Hasley plan				

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (5)

Question No.	Questions
25.	The most traditional and most often used work measurement technique is
1 1944 1 1946	(1) Time study-stop watch (2) Work sampling
	(3) Analytical estimating (4) Pre-determined motion time system
26.	Amortization means:
	(1) Liquidation of financial obligations
	(2) Liquidation of an industry
	(3) Commitment of financial obligations
	(4) Liquidation of financial obligations on the indeterminable
27.	In simplest method, the row to be replaced
1 - 1 - 1 - 10 - 10 - 1	(1) Zero (2) Less than zero
	(3) More than zero (4) Infinity
28.	Given set of vectors $(2, 3, -1)$, $(1, 7, -2)$ and $(3, 5, 2)$ in \mathbb{R}^3 is
-	(1) Linearly dependent over R ³
abrus G	(2) Linearly independent over R ³
1.5.177-202.01	(3) Will form a matrix with all zero solutions
	(4) System has no solution
29.	Suppose rank of a matrix $A_{(7\times8)}$ is 6, then which of the following is correct
	(1) A is invertible matrix
100000	(2) A is skew-symmetric matrix
	(3) A has fifteen linear independent solutions (1)
	(4) A will have six linearly independent rows and column

PHD/URS-EE-2022 (Mechanical Engineering) Code-C
(6)

Question No.	Questions Which one of the following is not a technique of PMTS?				
30.					
	(1) Synthetic data (2) Stop-watch time study				
	(3) Work factor (4) MTM				
31.	In the 3-2-1 principle of fixture design, 3 refers to number of				
	(1) Setup possible (2) Clamps required				
	(3) Positions on primary face (4) Locating positions				
32.	For resistance spot welding of 2.0 mm thick steel sheets, the current required is of the order of				
•	(1) 10 A (2) 100 A				
nerviciei	(3) 1000 A (4) 10,000 A				
33.	The ratio of surface area to volume for a unit volume of riser is minimum				
£	in case of himorate (8) hereoff (1.)				
	(1) Cylindrical riser (2) Spherical riser				
4-01-01	(3) Hemispherical riser (4) Cuboids riser				
34.	Which of the following cutting tool bits are made by powder metallurgy				
	(1) Carbon steel bits (2) Stellite tool bits				
	(3) Ceramic tool bits (4) All of the above				

SET-X Code-C

Question		Code-C
No.	Questions	
35.	For drilling aluminium, a drill with	
	(1) High helix angle is required	
	(2) Low helix angle is required	
	(3) Any helix angle can be used	
	(4) Zero helix angle is required	
36.	In Optiz code, the first five digits express	
	(1) Production operation type and sequence	
100	(2) Attributes which are used for manufacturing	
	(3) Primary design attributes of the part	
	(4) None of these	
37.	The probability distribution of project completion in PERT flo	ows following
	(1) Normal (2) Binomial	
	(3) Beta (4) Gaussian	
38.	From the point of motion economy it is preferable to move:	
ne la en	(1) Both hands in the same direction	
	(2) Right hand first and then the left hand	
	(3) Only one hand at a time	,
	(4) Both hands in opposite direction	

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (8)

Question No.	Questions		
39.	A device used for lifting or lowering objects suspended from a hook at the end of retractable chains or cable is called		
	(1) Hoist (2) Job crane		
	(3) Portable elevator (4) Chain conveyor		
40.	A diagram showing the path followed by men and materials while performing a task is known as:		
A 108	(1) String diagram (2) Flow process chart		
	(3) Travel chart (4) Flow diagram		
41.	A spring with 25 active coils cannot be accommodated within a given space. Hence 5 coils of the spring are cut. What is the stiffness of the new spring?		
-	(1) Same as the original spring		
2 -	(2) 1.25 times the original spring a print and a memoral of		
	(3) 0. times the original spring the galaxy and the control (2)		
	(4) 0.5 times the original spring		
42.	The effective diameter of an external or internal screw thread, is known as		
1	species a control of periods in any many periods and period and the latest and th		
	(1) Minor diameter (2) Major diameter		

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (9)

-			14
		Qi:	

Question No.	Questions				
43.	A point on a link connecting a double slider crank chain will trace a				
	(1) Straight line (2) Circle				
(4	(3) Parabola (4) Ellipse				
44.	In pivot bearing, the wear at the contact area is:				
	(1) Zero at the centre (2) Uniform throughout				
	(3) Max. at the centre (4) Max. at the outer radius				
45.	An involute pinion and gear are in mesh. If both have the same size of addendum, then there will be an interference between the				
	(1) Tip of the ear tooth and flank of pinion				
PRO IT	(2) Tip of pinion and flank of gear				
Billing /	(3) Flanks of both gear and pinion				
	(4) Tip of both ear and pinion				
46.	A spring controlled governor is found unstable. It can be made stable by				
	(1) Increasing the spring stiffness				
	(2) Decreasing the spring stiffness				
	(3) Increasing the ball weight				
*	(4) Decreasing the ball weight				
47.	The point on the cam with maximum pressure angle is called				
	(1) The trace point (2) The pitch point				
1.	(3) Cam centre (4) None of the above				

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (10)

Question No.	Questions
48.	Best position of crank for blanking operation in a mechanical press is
	(1) Top dead centre
	(2) 20 degree below top dead centre
	(3) 20 degress before bottom dead centre
	(4) Bottom dead centre
49.	A connecting rod has a mass of 0.5 kg, the radius of gyration through its centre of gravity is 5 cm and its acceleration is 2×10^4 rad/sec ² . The equivalent two mass system for the connecting rod has a radius of gyration 6 cm. What is the correction couple of the equivalent system?
	(1) 11 Nm (2) 9 Nm
burgh	(3) 6 Nm (4) 1 Nm
50.	Petroff's equation is used when journal
1, 14	(1) Coincides with bearing
	(2) Is concentric with bearing
	(3) Rotates in clockwise direction
	(4) Rotates in anticlockwise direction
51.	Water is flowing with a flow rate of 0.002 m ³ /s. What is the average velocit at an outlet where the area is 4 cm ² ?
	(1) 50 m/s (2) 20 m/s
	(3) 10 m/s stem primarily (+(4) 5 m/s remained to 10
	Machanical Engineering) Code-C

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (11)

Question No.	Questions					
52.	In a hydraulic coupling					
	(1) Slip is negligible at low speeds					
	(2) Efficiency of transmission is high at low speeds					
	(3) Slip is around 2 to 3 percent at the running speed					
	(4) Efficiency is high as compared to mechanical coupling					
53.	The magnus effect is defined as:					
r = 0, 1 :	(1) The generation of lift per unit drag force					
	(2) The circulation induced in an aircraft wing					
	(3) The separation of boundary layer near the trailing edge of a slender					
_	body					
	(4) The generation of lift on a rotating cylinder in a uniform flow					
54.	In a centrifugal compressor, the highest Mach number leading to shock					
	wave in the fluid flow occurs at					
	(1) Diffuser inlet radius (2) Diffuser outlet radius					
l void a	(3) Impeller inlet radius (4) Impeller outlet radius					
55.	The Moody diagram is used in fluid mechanics to obtain the					
- 1	(1) Drag coefficient (2) Strouhal number					
	(3) Friction factor (4) Manning constant					
	TURE SAME					

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (12)

a share			
	-		

Question No.	Questions						
56.	Hot oil is cooled from 80 to 50°C in an oil cooler which uses air as the coolant. The air temperature rises from 30 to 40°C. The designer uses a LMTD value of 26°C. The type of heat exchanger is						
	(1) Parallel	(2)	Double pipe				
	(3) Counter flow	(4)	Cross flow				
57.	Prandtl number has least va	lue in w	which of the following?				
	(1) Gases	(2)	Brine solution				
	(3) Liquid metal	(4)	Oil film				
58.	In spite of large heat transfer coefficients in boiling liquids, fins are used advantageously when the entire surface is exposed to						
	(1) Nucleate boiling	(2)	Film boiling				
	(3) Transition boiling	(4)	All modes of boiling				
59.	Fraction of radiative energy leaving one surface that strikes the o						
	(1) Radiative flux	(2)	Emissive power of the first surface				
	(3) View factor	(4)	Re-radiation flux				
60.	In unsteady-state heat cond gradients, the time tempera	ture var	or bodies with negligible temperature riation curve is				
	(1) Linear	(2)	Parabolic Parabo				
	(3) Sinusoidal	(4)	Exponential				

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (13)

Question No.	Questions	newlinn.
61.	A ladder is resting on a smooth ground and leaning against a r wall. The force of friction will act	ough vertica
	(1) Downward at its upper end	
	(2) Upward at its upper end	-1-
	(3) Zero at its upper end	
	(4) Perpendicular to the wall at its upper end	
62.	The acceleration of a particle with simple harmonic motion, at is given by	any instant
	(1) $\omega.y$ (2) $\omega^2.y$	
	(3) ω^2/y (4) $\omega^3.y$	
63.	A particle moves in a circular path with constant speed v. The velocity when it traverses an angle of 120° is	e change in
	(1) 2v (2) 2.5v spring standard	
• .	(3) $\sqrt{3}v$ (4) $3\sqrt{2}v$	
64.	For a 25 mm hole drilled in plates, the diameter of rivet shan	k should be
(//1/14 14	(1) 23 mm (2) 24.5 mm	59 Fra
_	(3) 25 mm (4) 26 mm	
65.	A beam of triangular section is placed with its base horizontal. The shear stress occurs at	ne maximum
a stare	(1) Apex of the triangle	ni .00
	(2) Mid of the height	373
	(3) Centre of gravity of the triange	
	(4) Base of the triangle	

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (14)

uestion No.	Questions
66.	Pitching of a ship exerts force on the bearings
	(1) Perpendicular to their axis
	(2) Along the axis of the bearings
	(3) Plain perpendicular to the pitching
	(4) None of the above
67.	A compound cylinder with inner radius 5 cm and outer radius 7 cm is made by shrinking one cylinder onto the other cylinder. The junction radius is 6 cm and the junction pressure is 11 kg/cm². The maximum hoop stress developed in the inner cylinder is (1) 36 kg/cm² compression (2) 36 kg/cm² tension (3) 72 kg/cm² tension (4) 72 kg/cm² tension
68.	A shaft was initially subjected to bending moment and then was subjected to torsion. If the magnitude of bending moment is found to be the same at the effective, then the ratio of maximum bending stress to shear stress.
- i in 27	would be work and the work of the second of
	(1) 0.25 (3) 2.0 (4) 4.0
DUL	O/URS-EE-2022 (Mechanical Engineering) Code-C (15)

Question No.	Questions	2011-004
69.	A transmission shaft subjected to bending loads must be des	igned on the
82 (4	(1) Maximum normal stress theory	
	(2) Maximum shear stress theory	
*	(3) Maximum normal stress and maximum shear stress the	ories
er m	(4) Fatigue strength	1 -
70.	Maximum shear stress in Mohr's circle is equal to	A .7%
90 at 16	(1) Radius of circle	
	(2) Diameter of circle	
	(3) Centre of circle from y-axis	73
	(4) Chord of circle	
71.	A mass M of a fluid at temperature T_1 is mixed with an equal same fluid at temperature T_2 . The resultant change in enuiverse is	
Megdine omen si	(1) Zero (2) Negligible	
	(3) Always negative (4) Always positive	is .
Ja 737	The second secon	
72.	If methane undergoes combustion with the stoichiometric quality fuel ratio on molar basis would be	
72.		

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (16)

Question No.	Questions					
73.	A cylinder contains 5 m ³ of ideal gas at a pressure of 1 bar. This gas is compressed in a reversible isothermal process till its pressure increases to 5 bar. The work in kJ is required for this process is					
	(1) 804.7 (2) 953.2					
	(3) 981.7 (4) 1012.2					
74.	Energy conversion takes place only in one row of rotor of nozzle blades and later the steam glides over the rotor and guide rows in the case of					
ATLI SIE SI	(1) De Laval turbine (2) Rateau turbine					
	(3) Parson's turbine (4) Curtis turbine					
75.	The degree of reaction of a turbine is the ratio of enthalpy drop in (1) Moving blades to enthalpy drop in the stage (2) Fixed blades to enthalpy drop in the stage					
61.7	(3) Moving blades to enthalpy drop in fixed blades(4) Fixed blades to enthalpy drop in moving blades					
76.	A solar energy based heat engine which receives 80 kJ of heat at 100°C and rejects 70 kJ of heat to the ambient at 30°C is to be designed. The thermal efficiency of the heat engine is:					
	(1) 70%					
	(2) 1.88%					
	(3) 12.5%					
	(4) Indeterminate					

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (17)

Question No.	Questions	200
77.	Which phenomena have the most adverse effect on volumetre when engine works at high speeds?	ric efficiency
*	(1) Flow friction and choking	
	(2) Ram effect and choking (3) Flow friction and charge heating	Ta)
nsy di.	(4) Charge heating and back flow	8 1 1
78.	In the Rankine cycle, lower limit on the condenser pressure is (1) Expansion limit in turbine	s due to the
d	(2) Condenser size(3) Air leakage into the condenser(4) Temperature of cooling water	9 .51
79.	(4) Temperature of cooling water Efficiency of nozzle governed turbine is affected mainly by los (1) Partial admission (2) Throttling (3) Interstage pressure drop (4) Condensation in last	sses to
80.	In a Carnot refrigeration cycle, for constant upper temperatulation lower temperature increases	are T _h , as the
i in	(1) COP increases (2) COP decreases	
	(3) Power consumption increases	a l
	(4) Heat transfer during isothermal process decreases	(4)

PHD/URS-EE-2022 (Mechanical Engineering) Code-C (18)

Question No.	Questions
81.	In inventory planning, extra inventory is unnecessarily carried to the end of the planning period when using one of the following lot size decision policies:
	(1) Lot-for-lot production (2) EOQ lot size
	(3) Period order quantity (4) Part period total cost balancing
82.	Dummy activities are used in a network to:
	(1) Facilitate computation of slacks
	(2) Satisfy precedence requirements
	(3) Determine project completion time
	(4) Avoid use of resource
83.	If the value of variance is more:
	(1) Certainty is more
	(2) Probability of certainty is more
	(3) Uncertainty is more
	(4) Probability distribution curve shall be having a unsymmetrical shape
84.	Bucket is a term used in MRP systems, it is a
	(1) Principal unit of time measurement
	(2) Demand for a raw material
	(3) Product mix
	(4) Material in hand
700	JRS-EE-2022 (Mechanical Engineering) Code-C (19)

Question No.	Questions	esc.				
85.	The probability law that determines the fluctuations of fracti	on defective				
\$1 	(1) Poisson (2) Normal					
1	(3) Binomial (4) Exponential					
86.						
	(1) Product (2) Service	1 28				
	(3) System (4) Function	1				
87.	Which of the following represents the reduction in duration?					
	(1) Crushing (2) Negative slack					
	(3) Variance (4) All of the above					
88.	For a skew-symmetric matrix, minimum possible rank is:					
- 1	(1) 0 (2) 1					
*	(3) Greater than 1 (4) 2	1) 1				
89.	Degeneracy in LPP method indicates					
	(1) Tie for key column (2) Tie for key row					
	(3) Infeasible problem (4) Multiple optional solutions	. 28				
90. Programmable Logic Controller is used for applications like						
	(1) On/Off control (2) Timing					
.	(3) Counting and sequencing (4) All of the above					
HD/UR	S-EE-2022 (Mechanical Engineering) Code-C	81777777				

With.

Question No.	Questions						100
91.	The	white aluminium	oxide is deno	ted by:	at periods	regard m	
	(1)	Al	(2)	A		3) 100	
	(3)	WA	(4)	WAL			
92.	The	length of approac	h in case of d				:
1	(1)	0.8 D	(2)	0.6 D		0 1 2 1	
	(3)	0.29 D	(4)	0.14 D	an Gur	- rell	Ex
93.	In c	hemical milling p	rocess, the ch	emical reag	ent for	steel wor	k piece is
	(1)	Nitric acid	(2)	Sodium su	lphate		
	(3)	Caustic soda	(4)	Sodium ch	loride	8 3 -	t.
94.	The numerical control machines are controlled by the tape whose width is						
	(1)	50 mm	(2)	$40\mathrm{mm}$		61.4	
	(3)	30 mm	(4)	20 mm			
95.	High speed steel tools retail their hardness upto a temperature of:						
5 15	(1)	1400°C	(2)	1200°C		68.4	(-)
	(3)	900°C	(4)	500°C	There a	L	A
96.	The	floating position	of the holdin	g fixture in	a rotai	ry transf	er device i
	used	d to:	- of locati	on			
	(1) Improve the accuracy of location						
	(2)	Reduce the tend	ency to cover-	Index		01400	ю.
	(3)	Improve upon th		and decel	eration	characte 04H0	ristics
	(4)	Reduce the cycle	time				

X-TB8

Question No.			Questions			
97.	Gea	r burnishing	is a process for :	. Br / L M Devot 10		
	(1)	Surface finis	shing			
	(0)	TT 1 .				
	(2)	Undercut ge	ears			
	(3)	Cycloidal ge	ears			
			- 14 E			
	(4)	Removing r	esidual stresses from teeth r	oots		
98.	During a single pass rolling processes, the thickness of metallic sheet i					
	reduced from 18 mm to 12 mm. Roll diameter is 500 mm. Angle of bite is					
	deg	rees is	and the state of the			
el dille	(1)	5.24	d balle-heren in real			
	(0)	4.770				
	(2)	4.79				
	(3)	8.83				
	(4)	6.68	TRANS C.			
			JH64]			
99.	A commonly used 30 mm H-hole with tolerance grade IT9 is expressed a					
	(1)		THE STATE OF THE PARTY OF THE P			
	\-/					
	(2)	30HIT9				
	(3)	30H9	zelim na vini vini			
	(0)		of white colle.			
23	. 4 7		The state of the s			
g.31	(4)	9H30		The state of the s		
.01		9H30	Iechanical Engineering	Total (F)		

SET-X Code-C

			Couc o
uestion No.	14	Questions	
100.	Stell	lite is a non ferrous cast alloy composed of	
	(1)	Cobalt, Chromium and Tungsten	
	(2)	Tungsten, Chromium and Vanadium	
	(3)	Molybdenum, Tungsten and Chromium	
	(4)	Tungsten, Chromium, Molybdenum and Vanadium	
		9°	
	-		
		*	
		at 1 wind Fugina 1 of C 1 of	
PH	D/UF	RS-EE-2022 (Mechanical Engineering) Code-(

SET-"X"

(Total No. of printed pages : 24)

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(PH.D/URS-EE-December-2022)

Mechanical Engineering Sr. No. 1002

Time: 14 Hours	Total Questi _ (in figure)		Max. Marks : 100
Roll No		Date of Birth: Mother's Name:_	
Father's Name : Date of Examination :			
Signature of the candidate	e)	(Signatu	re of the Invigilator

CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

All questions are compulsory.

The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

Keeping in view the transparency of the examination system, carbonless OMF Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by

Question Booklet along-with answer key of all the A,B,C and D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will considered.

The candidate MUST NOT do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers 5.

MUST NOT be ticked in the Question book-let. There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.

Use only Black or Blue BALL POINT PEN of good quality in the OMR Answer-7.

BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LET. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.



Question No.	Questions
1.	In inventory planning, extra inventory is unnecessarily carried to the end of the planning period when using one of the following lot size decision policies:
×	(1) Lot-for-lot production (2) EOQ lot size (3) Period order quantity (4) Part period total cost balancing
2.	Dummy activities are used in a network to:
	 Facilitate computation of slacks Satisfy precedence requirements Determine project completion time Avoid use of resource
3.	If the value of variance is more: (1) Certainty is more (2) Probability of certainty is more (3) Uncertainty is more (4) Probability distribution curve shall be having a unsymmetrical shape
4.	Bucket is a term used in MRP systems, it is a (1) Principal unit of time measurement (2) Demand for a raw material
	(3) Product mix (4) Material in hand RS-EE-2022 (Mechanical Engineering) Code-D (1)

Question No.	Questions			
5.	The probability law that determ	ines the fluctuations of fraction defective		
	and Market	2) Normal 4) Exponential		
6.	In value engineering "worth" is v			
	(1) Product (2) Service		
	(3) System (1) Function		
7.	Which of the following represent			
		2) Negative slack		
	(3) Variance (4	1) All of the above		
8.	For a skew-symmetric matrix, m	inimum possible rank is :		
	(1) 0	2) 1		
	(3) Greater than 1	1) 2		
9.	Degeneracy in LPP method indic	ates		
	(1) Tie for key column (2	2) Tie for key row		
	(3) Infeasible problem (4	Multiple optional solutions		
10.	Programmable Logic Controller is used for applications like			
	(1) On/Off control (2) Timing		
	(3) Counting and sequencing (4) All of the above		

PHD/URS-EE-2022 (Mechanical Engineering) Code-D

Question No.	Questions
11.	Water is flowing with a flow rate of 0.002 m^3 /s. What is the average velocity at an outlet where the area is 4 cm^2 ? (1) 50 m/s (2) 20 m/s (3) 10 m/s (4) 5 m/s
12.	In a hydraulic coupling (1) Slip is negligible at low speeds (2) Efficiency of transmission is high at low speeds (3) Slip is around 2 to 3 percent at the running speed (4) Efficiency is high as compared to mechanical coupling
13.	The magnus effect is defined as: (1) The generation of lift per unit drag force (2) The circulation induced in an aircraft wing (3) The separation of boundary layer near the trailing edge of a slender body (4) The generation of lift on a rotating cylinder in a uniform flow
91 14.	In a centrifugal compressor, the highest Mach number leading to shock wave in the fluid flow occurs at (1) Diffuser inlet radius (2) Diffuser outlet radius (3) Impeller inlet radius (4) Impeller outlet radius

PHD/URS-EE-2022 (Mechanical Engineering) Code-D
(3)

Question No.	Questions			
15.	The Moody diagram is used in fluid mechanics to obtain the			
	(1) Drag coefficient (2) Strouhal number			
	(3) Friction factor (4) Manning constant			
16.	Hot oil is cooled from 80 to 50°C in an oil cooler which uses air as the coolant. The air temperature rises from 30 to 40°C. The designer uses LMTD value of 26°C. The type of heat exchanger is			
	(1) Parallel (2) Double pipe			
	(3) Counter flow (4) Cross flow			
17.	Prandtl number has least value in which of the following?			
	(1) Gases (2) Brine solution			
	(3) Liquid metal (4) Oil film			
18.	In spite of large heat transfer coefficients in boiling liquids, fins are used advantageously when the entire surface is exposed to			
	(1) Nucleate boiling (2) Film boiling			
	(3) Transition boiling (4) All modes of boiling			
19.	Fraction of radiative energy leaving one surface that strikes the other surface is called			
	(1) Radiative flux (2) Emissive power of the first surface			
1	(3) View factor (4) Re-radiation flux			

PHD/URS-EE-2022 (Mechanical Engineering) Code-D
(4)

Question No.	Questions				
20.	In unsteady-state heat conduction for bodies with negligible temperature gradients, the time temperature variation curve is				
	(1) Linear (2) Parabolic				
	(3) Sinusoidal (4) Exponential				
21.	In the 3-2-1 principle of fixture design, 3 refers to number of				
	(1) Setup possible (2) Clamps required				
	(3) Positions on primary face (4) Locating positions				
22.	For resistance spot welding of 2.0 mm thick steel sheets, the current required is of the order of				
	(1) 10 A (2) 100 A				
	(3) 1000 A (4) 10,000 A				
23.	The ratio of surface area to volume for a unit volume of riser is minimum in case of				
	(1) Cylindrical riser (2) Spherical riser				
-	(3) Hemispherical riser (4) Cuboids riser				
24.	Which of the following cutting tool bits are made by powder metallurg				
	(1) Carbon steel bits (2) Stellite tool bits				
	(3) Ceramic tool bits (4) All of the above				

PHD/URS-EE-2022 (Mechanical Engineering) Code-D

Question	Questions
No. 25.	For drilling aluminium, a drill with (1) High helix angle is required (2) Low helix angle is required (3) Any helix angle can be used (4) Zero helix angle is required
26.	In Optiz code, the first five digits express (1) Production operation type and sequence (2) Attributes which are used for manufacturing (3) Primary design attributes of the part (4) None of these
27.	The probability distribution of project completion in PERT flows following distribution: (1) Normal (2) Binomial (3) Beta (4) Gaussian
	From the point of motion economy it is preferable to move: (1) Both hands in the same direction (2) Right hand first and then the left hand (3) Only one hand at a time 4) Both hands in opposite direction S-FE-2022 (Machanical Fracing entire). Code D

PHD/URS-EE-2022 (Mechanical Engineering) Code-D

uestion No.	Questions
29.	A device used for lifting or lowering objects suspended from a hook at the end of retractable chains or cable is called
	(1) Hoist (2) Job crane (3) Portable elevator (4) Chain conveyor
30.	A diagram showing the path followed by men and materials while performing a task is known as:
	(1) String diagram (2) Flow process chart (3) Travel chart (4) Flow diagram
31.	Design of shafts made of brittle materials is based on: (1) Guest's theory (2) Ranine's theory (3) St. Venant's theory (4) Von Mises theory
32.	According to Indian Boilers Regulations, the factor of safety in riveted joint should not be less than: (1) 1.5 (2) 2 (3) 4 (4) 6
33	Miter gears are: (1) Right angled bevel gears with same number of teeth (2) Spur gears with same number of teeth (3) Helical gears with same number of teeth (4) None of the above

PHD/URS-EE-2022 (Mechanical Engineering) Code-D (7)

Question No.	Questions (7) speed
34.	The bearing characteristic relating absolute viscosity of lubricant(Z), speed of journal (N) and bearing pressure (p) is defined as:
	(1) ZN/p (2) Zp/N
8	(3) pN/Z (4) ZpN
35.	What is sunk key made in the form of a segment of a circular disc of uniform thickness, known as?
	(1) Feather key (2) Kennedy key
	(3) Woodruff key (4) Saddle key
36.	Fluids that require a gradually increasing shear stress to maintain a constant strain rate are known as: (1) Rhedopectic fluids (2) Thixotropic fluid (3) Pseudoplastic fluid (4) Newtonian fluids
37.	The capillary rise at 20°C in clean glass tube of 1 mm diameter containin water is approximately. (1) 15 mm (2) 50 mm (3) 20 mm (4) 3 mm
38.	Prandtl's mixing length hypothesis is based on: (1) Eddy viscosity (2) Momentum exchange that occurs due to random motion (3) Similarity of turbulent flow pattern (4) None of the above

PHD/URS-EE-2022 (Mechanical Engineering) Code-D
(8)

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Question No.	Qı	uestions			
39.	In the case of pelton turbine installed in a hydraulic power plant, the gross head available is the vertical distance between				
	(1) Forebay and tail race				
	(2) Reservoir level and turb	oine inlet	Books and a contract		
	(3) Forebay and turbine inle	et	TATE OF		
	(4) Reservoir level and tail	race			
40.	In a centrifugal pump when fluid inside the pump will		ally closed, the pressure of		
	(1) Become zero	(2) Reduce			
8. 1	(3) Increase	(4) Remain una	altered		
41.	The white aluminium oxide i	s denoted by :			
	(1) Al	(2) A	and the same of the same of		
	(3) WA	(4) WAL	e h Admid a k		
42.	The length of approach in ca	se of drilling opera	tion is equal to :		
	(1) 0.8 D since (1991) (1)	(2) 0.6 D			
i jaëde	(3) 0.29 D	(4) 0.14 D	ration in the second		
43.	In chemical milling process,	the chemical reage	ent for steel work piece is		
	(1) Nitric acid	(2) Sodium sul	phate		
- 15	(3) Caustic soda	(4) Sodium chl	oride		

PHD/URS-EE-2022 (Mechanical Engineering) Code-D

Question No.	· Quodent				
44.	The numerical control machines are controlled by the tape whose width in (1) 50 mm (2) 40 mm (3) 30 mm (4) 20 mm				
45.	High speed steel tools retail their hardness upto a temperature of: (1) 1400°C (2) 1200°C (3) 900°C (4) 500°C				
46.	The floating position of the holding fixture in a rotary transfer device is used to: (1) Improve the accuracy of location (2) Reduce the tendency to cover-index (3) Improve upon the acceleration and deceleration characteristics (4) Reduce the cycle time				
47.	Gear burnishing is a process for: (1) Surface finishing (2) Undercut gears (3) Cycloidal gears (4) Removing residual stresses from teeth roots				
48.	During a single pass rolling processes, the thickness of metallic sheet is reduced from 18 mm to 12 mm. Roll diameter is 500 mm. Angle of bite is degrees is (1) 5.24 (2) 4.79 (3) 8.83 (4) 6.68				

PHD/URS-EE-2022 (Mechanical Engineering) Code-D
(10)

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11-		

Question No.	Questions
49.	A commonly used 30 mm H-hole with tolerance grade IT9 is expressed as (1) 30IT9 (2) 30HIT9 (3) 30H9 (4) 9H30
50.	Stellite is a non ferrous cast alloy composed of (1) Cobalt, Chromium and Tungsten
11701 x	 (2) Tungsten, Chromium and Vanadium (3) Molybdenum, Tungsten and Chromium (4) Tungsten, Chromium, Molybdenum and Vanadium
51.	Forecasting which assumes a static environment in the future is: (1) Passive forecasting (2) Active forecasting (3) Long term forecasting (4) Short term forecasting
52.	In production, planning and control, the document which authorizes the start of an operation on the shop floor is the: (1) Dispatch order (2) Route plan (3) Loading chart (4) Schedule
53.	In a study to estimate the idle time of a machine, out of 100 random observations the machine is found idle on 40 observations. The total random observations for 95% confidence level and ±5% accuracy are: (1) 384 (2) 600 (3) 2400 (4) 9600
	(3) 2400 (4) 9600

PHD/URS-EE-2022 (Mechanical Engineering) Code-D (11)

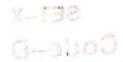
Question No.	Questions	ogo and
54.	Which of the following wage incentive plan guarantees minimum we bonus is paid for the fixed percentage of time saved? (1) Hasley plan (2) Emerson plan (3) Haynes plan (4) Gnatt plan	
55.	The most traditional and most often used work measurement tech (1) Time study-stop watch (2) Work sampling (3) Analytical estimating (1) Pre-determined motion time	
56.	Amortization means: (1) Liquidation of financial obligations (2) Liquidation of an industry (3) Commitment of financial obligations (4) Liquidation of financial obligations on the indeterminable	Jú
57.	(1) Zero (2) Less than zero (3) More than zero (4) Infinity	.63.
58.	(1) Linearly dependent over R3	

PHD/URS-EE-2022 (Mechanical Engineering) Code-D (12)

Questio No.	Questions		
59.	Suppose rank of a matrix A _(7x8) is 6, then which of the following is correct		
	(1) A is invertible matrix		
	(2) A is skew-symmetric matrix		
	(3) A has fifteen linear independent solutions		
	(4) A will have six linearly independent rows and column		
60.	Which one of the following is not a technique of PMTS?		
	(1) Synthetic data (2) Stop-watch time study		
	(3) Work factor (4) MTM		
	a head and produced grown and		
61.	A mass M of a fluid at temperature T ₁ is mixed with an equal mass of the		
	same fluid at temperature T ₂ . The resultant change in entropy of the		
A.	universe is		
Work -	(1) Zero (2) Negligible		
	(3) Always negative (4) Always positive		
62.	If methane undergoes combustion with the stoichiometric quantity of air		
-	fuel ratio on molar basis would be		
ley sale	(1) 15.22:1 (2) 12.30:1		
	(3) 14.56:1 (4) 9.52:1		
63.	A cylinder contains 5 m ³ of ideal gas at a pressure of 1 bar. This gas is		
10	compressed in a reversible isothermal process till its pressure increases		
t	o 5 bar. The work in kJ is required for this process is		
1 .	1) 804.7 (2) 953.2		
	The state of the s		

PHD/URS-EE-2022 (Mechanical Engineering) Code-D (13)

23



Question	Questions
No. 64.	Energy conversion takes place only in one row of rotor of nozzle blades and later the steam glides over the rotor and guide rows in the case of (1) De Laval turbine (2) Rateau turbine (3) Parson's turbine (4) Curtis turbine
65.	The degree of reaction of a turbine is the ratio of enthalpy drop in (1) Moving blades to enthalpy drop in the stage (2) Fixed blades to enthalpy drop in the stage (3) Moving blades to enthalpy drop in fixed blades
ad los	(4) Fixed blades to enthalpy drop in moving blades
66.	A solar energy based heat engine which receives 80 kJ of heat at 100°C and rejects 70 kJ of heat to the ambient at 30°C is to be designed. The thermal efficiency of the heat engine is: (2) 1.88%
rin ber	(3) 12.5% (4) Indeterminate
	Which phenomena have the most adverse effect on volumetric efficiency
67.	when engine works at high speeds? (1) Flow friction and choking

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(14)

SET-X Code-D

Question	
No.	Questions
68.	In the Rankine cycle, lower limit on the condenser pressure is due to the
	(1) Expansion limit in turbine
	(2) Condenser size
	(3) Air leakage into the condenser
	(4) Temperature of cooling water
69.	Efficiency of nozzle governed turbine is affected mainly by losses to
	(1) Partial admission (2) Throttling
	(3) Interstage pressure drop (4) Condensation in last
70.	In a Carnot refrigeration cycle, for constant upper temperature T_h , as the lower temperature increases
	(1) COP increases
	(2) COP decreases
	(3) Power consumption increases
gairts	(4) Heat transfer during isothermal process decreases
71.	In the forging operation, fullering is done to:
	(1) Draw out the material
	(2) Bend the material
	(3) Upset the material
	(4) Extrude the material
Property of the last	ing) Code D

PHD/URS-EE-2022 (Mechanical Engineering) Code-D
(15)

uestion No.	Questions
72.	A spherical drop of molten metal of radius 2 mm was found to solidify in 10 seconds. A similar drop of radius 4 mm would solidify in :
	(1) 14.14 seconds (2) 20 seconds
	(3) 18.30 seconds (4) 40 seconds
73.	Directional solidification in castings can be improved by using:
	(1) Chills and chaplets (2) Chills and padding
	(3) Chaplets and padding (4) Chills, chaplets and padding
74.	Preheating before welding is done to:
	(1) Make the steel softer
	(2) Burn away oil, grease etc. from the plate surface
	(3) Prevent cold cracks
	(4) Prevent plate distortion
75.	Which one of the following sets of forces are encountered by a lathe partin
	tool while groove cutting
	(1) Tangential, radial and axial
	(2) Tangential and radial
	(3) Tangential and axial
	(4) Radial and axial

PHD/URS-EE-2022 (Mechanical Engineering) Code-D
(16)

lead screw with a double start thread of pitch 4 mm. The ratio of speeds between the spindle and lead screw for this operation is: (1) 1:2 (2) 2:1 (3) 1:4 (4) 4:1 78. Crater wear is predominant in: (1) Carbon steel tools (2) Tungsten carbide tools (3) High speed steel tools (4) Ceramic tools 79. A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend? (1) Grinding (2) Rough Turning (3) Lapping (4) Honing	Question No.	Questions
(3) Dense structure (4) High mould rotation speed 77. A single short thread of pitch 2 mm is to be produced on a lathe having a lead screw with a double start thread of pitch 4 mm. The ratio of speeds between the spindle and lead screw for this operation is: (1) 1:2 (2) 2:1 (3) 1:4 (4) 4:1 78. Crater wear is predominant in: (1) Carbon steel tools (2) Tungsten carbide tools (3) High speed steel tools (4) Ceramic tools 79. A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend? (1) Grinding (2) Rough Turning (3) Lapping (4) Honing 80. A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm	76.	Poor machinability of centrifugally cast iron pipe is due to:
77. A single short thread of pitch 2 mm is to be produced on a lathe having a lead screw with a double start thread of pitch 4 mm. The ratio of speeds between the spindle and lead screw for this operation is: (1) 1:2 (2) 2:1 (3) 1:4 (4) 4:1 78. Crater wear is predominant in: (1) Carbon steel tools (2) Tungsten carbide tools (3) High speed steel tools (4) Ceramic tools 79. A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend? (1) Grinding (2) Rough Turning (3) Lapping (4) Honing 80. A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm		(1) Chilling (2) Segregation
lead screw with a double start thread of pitch 4 mm. The ratio of speeds between the spindle and lead screw for this operation is: (1) 1:2 (2) 2:1 (3) 1:4 (4) 4:1 78. Crater wear is predominant in: (1) Carbon steel tools (2) Tungsten carbide tools (3) High speed steel tools (4) Ceramic tools 79. A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend? (1) Grinding (2) Rough Turning (3) Lapping (4) Honing 80. A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm		(3) Dense structure (4) High mould rotation speed
(3) 1:4 (4) 4:1 78. Crater wear is predominant in: (1) Carbon steel tools (2) Tungsten carbide tools (3) High speed steel tools (4) Ceramic tools 79. A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend? (1) Grinding (2) Rough Turning (3) Lapping (4) Honing 80. A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm	77.	A single short thread of pitch 2 mm is to be produced on a lathe having a lead screw with a double start thread of pitch 4 mm. The ratio of speeds between the spindle and lead screw for this operation is:
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(1) Carbon steel tools (2) Tungsten carbide tools (3) High speed steel tools (4) Ceramic tools 79. A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend? (1) Grinding (2) Rough Turning (3) Lapping (4) Honing 80. A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm		(3) 1:4 (4) 4:1
(3) High speed steel tools (4) Ceramic tools 79. A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend? (1) Grinding (2) Rough Turning (3) Lapping (4) Honing 80. A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm	78.	Crater wear is predominant in:
79. A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend? (1) Grinding (2) Rough Turning (3) Lapping (4) Honing 80. A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm		(1) Carbon steel tools (2) Tungsten carbide tools
Which machining process would you recommend? (1) Grinding (2) Rough Turning (3) Lapping (4) Honing 80. A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm		(3) High speed steel tools (4) Ceramic tools
(1) Grinding (2) Rough Turning (3) Lapping (4) Honing 80. A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm	79.	A surface finish of 0.025-0.1 micrometer CLA values to be produced. Which machining process would you recommend?
80. A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm		(0) Pough Turning
at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar. If the table feed is 400 mm/minute, the feed per tooth in this operation will be: (1) 0.2 mm (2) 0.4 mm (4) 0.6 mm		(3) Lapping (4) Honing
(1) 0.2 mm (4) 0.6 mm	80.	A straight teeth slab milling cutter of 100 mm diameter and 10 teeth rotating at 200 rpm is used to remove a layer of 3 mm thickness from a steel bar. If the table feed is 400 mm/minute, the feed per tooth in this operation will be:
(4) 0.6 mm		(1) 0.2 mm (2) 0.4 mm
		(4) 06 mm

PHD/URS-EE-2022 (Mechanical Engineering) Code-D (17)

uestion No.	Questions
81.	A ladder is resting on a smooth ground and leaning against a rough vertical wall. The force of friction will act (1) Downward at its upper end (2) Upward at its upper end (3) Zero at its upper end (4) Perpendicular to the wall at its upper end
82.	The acceleration of a particle with simple harmonic motion, at any instant is given by (1) ω .y (2) ω^2 .y (3) ω^2/y (4) ω^3 .y
83.	A particle moves in a circular path with constant speed v. The change in velocity when it traverses an angle of 120° is (1) 2v (2) 2.5v (3) √3v (4) 3√2v
84.	For a 25 mm hole drilled in plates, the diameter of rivet shank should b (1) 23 mm (2) 24.5 mm (3) 25 mm (4) 26 mm
85.	A beam of triangular section is placed with its base horizontal. The maximus shear stress occurs at (1) Apex of the triangle (2) Mid of the height (3) Centre of gravity of the triange (4) Base of the triangle

Question No.	Questions
86.	Pitching of a ship exerts force on the bearings (1) Perpendicular to their axis (2) Along the axis of the bearings (3) Plain perpendicular to the pitching (4) None of the above
87.	A compound cylinder with inner radius 5 cm and outer radius 7 cm is made by shrinking one cylinder onto the other cylinder. The junction radius is 6 cm and the junction pressure is 11 kg/cm². The maximum hoop stress developed in the inner cylinder is (1) 36 kg/cm² compression (2) 36 kg/cm² tension (3) 72 kg/cm² compression (4) 72 kg/cm² tension
	A shaft was initially subjected to bending moment and then was subjected to torsion. If the magnitude of bending moment is found to be the same as that of torque, then the ratio of maximum bending stress to shear stress would be (1) 0.25 (2) 0.50 (3) 2.0 (4) 4.0

PHD/URS-EE-2022 (Mechanical Engineering) Code-D (19)

Question No.	Questions
89.	A transmission shaft subjected to bending loads must be designed on the basis of (1) Maximum normal stress theory (2) Maximum shear stress theory (3) Maximum normal stress and maximum shear stress theories (4) Fatigue strength
90.	Maximum shear stress in Mohr's circle is equal to (1) Radius of circle (2) Diameter of circle (3) Centre of circle from y-axis (4) Chord of circle
91.	A spring with 25 active coils cannot be accommodated within a given space. Hence 5 coils of the spring are cut. What is the stiffness of the new spring (1) Same as the original spring (2) 1.25 times the original spring (3) 0. times the original spring (4) 0.5 times the original spring

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(20)

Question No.	Questions	
92.	The effective diameter of an external or internal screw thread, is known as	
	(1) Minor diameter (2) Major diameter	
8e c	(3) Pitch diameter (4) None of these	
93.	A point on a link connecting a double slider crank chain will trace a	
	(1) Straight line (2) Circle	
	(3) Parabola (4) Ellipse	
94.	In pivot bearing, the wear at the contact area is:	
	(1) Zero at the centre (2) Uniform throughout	
* *	(3) Max. at the centre (4) Max. at the outer radius	
95.	An involute pinion and gear are in mesh. If both have the same size of addendum, then there will be an interference between the	
	(1) Tip of the ear tooth and flank of pinion	
et dano	(2) Tip of pinion and flank of gear	
has the	(3) Flanks of both gear and pinion	
THE STATE OF	(4) Tip of both ear and pinion	
96.	A spring controlled governor is found unstable. It can be made stable by	
	(1) Increasing the spring stiffness	
-58	(2) Decreasing the spring stiffness	
	(3) Increasing the ball weight	
	(4) Decreasing the ball weight	

SET-X

PHD/URS-EE-2022 (Mechanical Engineering) Code-D (21)

Question No.	Questions				
97.	The point on the cam with maximum pressure angle is called				
	(1) The trace point				
	(2) The pitch point				
	(3) Cam centre				
	(4) None of the above				
98.	Best position of crank for blanking operation in a mechanical press is				
	(1) Top dead centre				
	(2) 20 degree below top dead centre				
	(3) 20 degress before bottom dead centre				
	(4) Bottom dead centre				
99.	A connecting rod has a mass of 0.5 kg, the radius of gyration through it centre of gravity is 5 cm and its acceleration is 2×10^4 rad/sec. The equivalent two mass system for the connecting rod has a radius of gyration 6 cm. What is the correction couple of the equivalent system?				
ble by	(1) 11 Nm				
	(2) 9 Nm				
	(3) 6 Nm				
`	(4) 1 Nm				

SET-X Code-D

Question		Code-D
Question No.	Questions	
100.	Petroff's equation is used when journal	
	(1) Coincides with bearing	
	(2) Is concentric with bearing	
	(3) Rotates in clockwise direction	
-	(4) Rotates in anticlockwise direction	
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PHD/URS-EE-2022 (Mechanical Engineering) Code-D (23)

0. N/O	ANSWER KEYS OF M			D
Q. NO,	A	В	С	
1	4	4	2	3
2	2	4	3	2
3	3	1	1	3
4	1	4	1	1
5	2	1	3	3
6	2	3	1	4
7	4	3	4	3
8	3	4	2	3
9	3	1	2	2
10	1	1	4	4
11	2	4	1	4
12	3	4	1	3
13	4	2	2	4
14	1	3	3	3
15	2	1	1	3
16	2	2	2	4
17	2	4	4	3
18	3	4	2	2
19	1	1	3	2
20	2	2	1	4
21	2	3	1	4
22	3	2	1	4
23	1	3	3	2
24	1	1	1	3
25	3	3	1	1
26	1	4	4	2
27	4	3	3	4
28	2	3	2	4
29	2	2	4	1
30	4	4	2	2
31	4	4	4	2
32	3	2	4	3
33	4	3	2	1
34	3	1	- 3	1
35	3	2	1	3
36	4	2	2	1
37	3	4	4	4
38	2	3	4	2
39	2	3	1	2
40	4	1	2	4
41	4	1	2	2
42	4	1	3	3
43	1	2	4	1
44	4	3	1	4
45	1	1	2	3
46	3	2	2	4
47	3	4	2	1
48	4	2	3	3
49	1	3	1	3
50	1	1	2	1

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	ANSWER KEYS OF M		1	-
Q. NO.	Α	В	С	D
51	1	2	4	1
52	1	3	3	1
53	2	1	4	3
54	3	4	3	1
55	1	3	3	1
56	2	4	4	4
57	4	1	3	3
58	2	3	2	2
59	3	3	2	4
60	1	1	4	2
61	2	2	4	4
62	3	3	2	4
63	1	1	3	1
64	4	1	1	4
65	3	3	2	1
66		1	2	3
	4			
67	1	4	4	3
68	3	2	3	4
69	3	2	3	1
70	1	4	1	1
71	4	2	4	1
72	4	3	4	1
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80	2	2	1	1
81	1	1	3	4
82	1	1	2	2
83	3	3	3	3
84	1	1	1	1
85	1	1	3	2
86	4	4	4	2
87	3	3	3	4
88	2	2	3	3
89	4	4	2	3
90	2	2	4	1
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93	3	4	1	4
94	1	3	4	1
95	3	3	3	2
96	4	4	4	2
97	3	3	1	2
98	3	2	3	3
99	2	2	3	1
100	4	4	1	2

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