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·.	Booklet Series			Number	
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•	MECHA	NICAL A	ND PRODUC	CTION EN	GINEERING
T	ime Allowe'd : 3 I	Hours]			[Maximum Marks : 30
	Read the follow	wing instruction	ons carefully before	e you begin to a	answer the questions.
******		<u></u>	IMPORTANT INSTRU	CTIONS	
1.	This Booklet has				the invigilator gives signal
	• •			-	il is received you should te
2.				booklet. Then pro	ceed to answer the question
3			v questions.		
4.					
5.	The Test Booklet	is printed in fou	r series e.g. A B	C or D (S	ee Top left side of this page
	The candidate ha	s to indicate in t	he space provided in t	the Answer Sheet	the series of the booklet. F
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61				vided on the top r	ight side of this page. Do n
ÿ	 write anything els An Answer Sheet 			the Invigilator to	mark the answers. You mu
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8.	You will also enco	ode your Register	Number, Subject Co	de etc., with Blue	e or Black ink Ball point pe
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9.					to select ONLY ONE correct
	response and ma	urk in your Ansv	ver Sheet. In case yo	ou feel that there	e are more than one corre
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10			r brackets [A] [B] [(Cland [D] again	nst each question. To answe
.,	the questions you	u are to mark	with Ball point pen	ONLY ONE brac	ket of your choice for eac
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	Sheet, If you mar	k more than one	answer for one quest	tion, the answer	will be treated as wrong. e.
	it for any item, (B)	is the correct an	iswer, you have to ma		
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11	. You should not re	move or tear off	any sheet from this (Question Booklet.	You are not allowed to tak
	After the examinat	tion is concluded	swei oneet out of th	vour Answer Sh	lall during the examinatior eet to the Invigilator. You ar
	allowed to take the	e Question Bookl	et with you only after	the Examination	is over.
12	. Failure to comply	with any of the a	bove instructions will	render you liable	to such action or penalty a
13	the Commission m . Do not tick-mark (ir discretion. vers in the Question B	looklet	
14	. The last page of th	e Question Book	let can be used for Ro	ugh Work.	
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1.	For	ship vessel industry which of the	Ioliowin	g layouts is best suited ?
,	A)	Process layout	B)	Product layout
	C)	Fixed position layout	D)	Plant layout.
2.	The	main disadvantage(s) of line orga	nization	is / are
	A)	top level executives have to do a	excessive	work
Ņ	B)	structure is rigid		
	C)	communication delays occur		
	D) -	all of these.		
3.	The	chart which is not used in motion	n study i	S
	A)	Simo chart	B)	Travel chart
	C)	Two-hand chart	D)	Man-machine chart.
4.	In t	he case of mass production		`
	A)	highly skilled workers are neede	d	
	B)	unit costs are high		
	C)	the operations are capital-intens	ive	
	D)	the operations are labour-intens	ive.	
5.	Mili	tary type organisation is known a	5	
	A)	line organisation		
	B)	functional organisation		
••••	C)	line and staff organisation		
	D)	line, staff and functional organis	ation.	
6.		• –		nagement which affect the entire
	огда	anisation are decis	ions.	
	A)	programmed	B)	routine
	C)	certainty	D)	non-programmed.
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7.	The	e short-term goals of supervisory level	mana	agers are called goals.
	A)	operational	B)	tactical e
·	C)	strategic	D)	programme.
8.	Pro	ductivity is given by		
	A)	Input Output	B)	Output Input
•	C)	Efficiency Effectiveness	D) .	Effectiveness × Efficiency.
9.	The	e chronological sequence of required a	action	s is called a
	A)	Rule	B)	Programme
	C)	Procedure	D)	Premise.
10.	The	eory X and Theory Y were developed b	у	
	· A)	Abraham Maslow	B)	Peter Drucker
	C)	Elton Mayo	D)	Douglas McGregor.
11.		nich of the following types of gauge end?	ge ha	as gauging sections combined on
	A}	Combination gauge	B)	Limit gauge
	Ć)	Go and NoGo gauge	D)	Progressive gauge.
12.	Cor	nstant measuring pressure in microm	neter s	screw gauges is ensured by
	A)	locknut	B)	barrel and thimble
	C)	ratchet	D)	spanner.
13.	It is to	s desirable to handle the slip gauges	with	a cloth or chamois leather in order
	A)	avoid injury to hands		
	B)	protect the surfaces of slip gauges		
	C)	insulate them from the heat of the	hand	
	D)	ensure that the varnish applied on	gauge	es does not come out.
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Eden-Rolt comparator is a popular instrument for the

calibration of slip gauges A) absolute measurement of length of slip gauges B) measurement of flatness C) D) measurement of angles. Money required for the purchase of stores, payment of wages etc. is known as 15. Block capital B) **Reserved** capital A) C) Authorised capital DI Working capital. In A-B-C control policy, maximum attention is given to 16. A) those items which consume money B) those items which are not readily available CI those items which consume more money those items which are in more demand. D 17. Emergency rush order can be pushed more effectively in automatic production A) job production B) C) continuous production D) intermittent production. In time study rating factor is equal to (standard time = t_1 , selected time = t_2 and 18. percentage time on allowance = t_3)

A) $\frac{t_1}{t_2} \times \frac{100 - t_3}{100}$ B) $\frac{t_1}{t_2} \times \frac{10}{100 - t_3}$ C) $\frac{t_2}{t_1} \times \frac{100 - t_3}{100}$ D) $\frac{t_2}{t_1} \times \frac{100}{100 - t_3}$

- 19. Work study is concerned with
 - A) improving present method and finding standard time
 - B) motivation of workers
 - C) improving production capability
 - D) improving production planning and control.

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20.	Wor	k study comprises which of the follo	owing	main techniques ?		
	A) Method study and work measurement					
	B)	Method study and time study		· ·		
	C)	Time study and work measureme	nt	. · · · ·		
	D)	Method study and job evaluation.				
21.	Gea	r finishing operation is called				
	A)	shaping	B)	milling		
	C)	hobbing	D)	varnishing.		
22.		ch of the following processes is use faces and thin sections ?	ed for	preparing parts having large curved		
	A)	Hot machining	B)	Ultrasonic machining		
	C)	ECM process	D)	Chemical milling.		
23.	Thre	ead grinding requires work speed fr	om	· ·		
·	A)	1 to 3 m/min	B)	5 to 10 m/min		
	C)	10 to 14 m/min	D)	14 to 20 m/min.		
24.		process of removing surface rough the previous operations is called	mess,	tool marks and other minor defects		
	A}	lapping	B)	høning		
	C)	broaching	D)	reaming.		
25.	••••	system is not an 'island	of au	tomation'.		
	A)	Computer Numerical Control	B)	Robotic		
	C}	Automated storage / Retrieval	D)	Flexible Manufacturing.		
26.	The	equipment that measures surface	roughr	ness is		
	A)	Profile projector	B)	Laser interferometer		
	C)	Profile gauge	D)	Profilometer.		
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27.	Exp	pressing a dimension as $\frac{36 \cdot 2}{36 \cdot 0}$ mr	n is the g	case of	
	A)	bilateral tolerancing	B)	limiting dimensions	
	C)	unilateral tolerancing	D)	plus-minus tolerancing.	
28.	Aut	to collimator is used for	mea	surement.	
	A)	straightness	B)	angular	
	C)	linear movement	D)	flatness.	
29.	Wh	ich of the following gives an idea	about th	ne ability of the equipment to detect	
ř	sm	all variation in the input signal (qu	uantity b	eing measured) ?	
ż	A)	Readability	B)	Accuracy	
	C)	Sensitivity	D)	Precision.	
30.	Parasitic error is caused due to				
	A)	improper use of measuring instr	rument		
	B)	wrong design of instrument			
	C)	changes in ambient conditions			
	D)	errors in computation.			
31.	The	cutting speed of a drill depends a	pon the		
	A)	material of drill	B)	type of material to be drilled	
•	C).	quality of surface finish desired	D)	all of these.	
32.	Â'tv	wist drill is a / an			
	A)	side cutting tool	B)	front cutting tool	
	C}	end cutting tool	D)	none of these.	
33.	Dri	lling is an example of			
	A)	simple cutting	B)	uniform cutting	
	C)	orthogonal cutting	D)	oblique cutting.	
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34.	Whi	ich of the following is not the par	t of a sha	per ?
	A)	Clapper box	B)	Ram
	C }	Table	D)	Cross slide.
35.	The	tool used for drilling holes of la	rge diam	eter (diameter greater than 80 mm)
	is		. •	
	A)	trepanning drill	B)	double-flute twist drill
	C)	single flute drill	D)	multiple flute drill with a web.
36.	The	process that provides a recess for	or seating	of bolt heads and nuts is
	A)	spot facing	B)	counter sinking
	C)	reaming	D)	counter boring.
37.		-	nishing ti	he work which has been bored and
	-	tly turned on the lathe is		
	A)	an Arbor	B)	a steady rest
·	C)	a collet chuck	D)	a Mandrel.
38.	A h	ole of 1 mm is to be drilled in gla	ss. It cou	ld best be done by
	A)	laser drilling		
	B)	plasma arc drilling		· ·
	C)	ultrasonic method	·	
	D)	electro-chemical discharge met	hod.	
39 .	The	e abrasive slurry used in ultrason	lic machin	ning contains fine particles of
	A)	aluminium oxide	B)	boron carbide
	C)	silicon carbide	D)	any one of these.
40.	Bui	ffing wheels are made of		
	A)	softer metals	B)	cotton fabric
	C)	carbon	D}	graphite.
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In worm gears, the angle between the tangent to the pitch helix and an element of the cylinder is known as B) pressure angle pitch lead angle none of these. . D) The rubbing speed of worm gear is said to be B) 5 m/sD) 12.5 m/s. A V-belt should touch the pulley groove at the bottom only B) bottom and sides D) one side only. The type of gears used for noise-free power transmission is B) helical gears D) epicyclic gears.

The gears used to connect two non-intersecting non-coplanar shafts are 45.

4 A)	bevel gears	T	B)	helical gears	
C)	spiral gears		D)	spur gears.	

46. The surface of the gear tooth below the pitch surface is known as

A) flank B) dedendum addendum C) D) face.

Find the correct statement : 47.

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A)

C)

A)

C)

A}-

C)

A)

C)

helix angle

2.5 m/s

7.5 m/s

sides only

spur gears

involute gears

 F_n accelerates the chip upwards A)

 F_n accelerates but F_s retards the chip equally B)

C} F_s retards the chip but N accelerates equally

D) ... All the four forces together keep the chip in equilibrium.

 F_n = perpendicular to shear plane, F_s = parallel to shear plane, F = parallel to tool chip interface, N = normal to tool chip interface.

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	48.	Whi	ch one cannot be oblique cutting ?		
		A)	Turning	B)	Milling
		C)	Broaching	D)	Boring.
	49.	The	work or surface speed for cylindrica	l grino	ding varies from
		A)	5 to 10 m/min	B)	10 to 20 m/min
.•		C)	20 to 30 m/min	D)	40 to 60 m/min.
	50.	The	helix angle of a drill is	. for d	rilling brass.
		A)	equal to 30°	B)	less than 30°
		C)	more than 30°	D)	none of these.
	51.	Acc	onnecting rod is designed as a		
		A)	long column	B)	short column
		C)	strut	D)	none of these.
	52.	A co	otter joint is used to transmit		
	, ·	A)	axial tensile load only		
		B)	axial compressive load only		
		C)	combined axial and twisting loads		
		D)	axial tensile or compressive loads.		
	53.	A fe	ather key is generally		
		A)	loose in shaft and tight in hub	B)	tight in both shaft and hub
		C)	tight in shaft and loose in hub	D)	loose in both shaft and hub.
	54.	A sl	iding bearing which operates withou	t any	lubricant present is called
		A)	zero film bearing	B)	boundary lubricated bearing
		C)	hydrodynamic lubricated bearing	D)	hydrostatic lubricated bearing.
	55.	Whi	ch type of spring is used in table clo	cks oi	ut of the following ?
		A)	Spiral	B)	Leaf
		C)	Helical	D)	Conical.
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56. The bearing efficiency of a riveted joint is given by

A)
$$\frac{p-d_0}{p}$$

C) $\frac{d_0}{p}$
B) $\frac{p}{d_0}$
D) $\frac{p-2d_0}{p}$

where d_0 = rivet hole diameter, p = pitch.

57. For a screw to be of the self locking type, its efficiency should be

A)	equal to 50%		B)	less than 50%	
		-			
C)	more than 50%		D)	less than 25%.	

- 58. In Journal bearings, the load acts
 - A) perpendicular to the axis of the shaft
 - B) along the axis of the shaft
 - C) parallel to the axis of the shaft
 - D) none of these.

59. Diametral quotient is defined as

- A) reference dia / axial module B) axial module / reference dia
- C) axial pitch / pitch dia D) pitch dia / axial pitch.

60. V-belt drives can be safely used for peripheral velocities of

- A) 5 10 m/sec B) 10 20 m/sec
- C) 25 30 m/sec D) 35 50 m/sec.

61. The critical speed of a shaft depends upon its

- A) mass B) stiffness
- C) mass and stiffness D) stiffness and eccentricity.

62. The radial distance from the top of a tooth to the bottom of a tooth is called

A) dedendum B) addendum

D) working depth.

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C)

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63.	The	frictional torque transmitted by a d	isc of	plate clutch is same as that of
	A) .	flat pivot bearing	B)	flat collar bearing
	C)	conical pivot bearing	D)	none of these.
64.	The	swaying couple is due to the		
•	A)	primary unbalanced force	B)	secondary unbalanced force
	C)	two cylinders of locomotive	D)	partial balancing.
65.	The	primary unbalanced force is maxi	imum	in one revolution of
	the	crank.		v
	A)	twice	B)	four times
	C)	eight times	D)	sixteen times.
66.		-		over which the gears are mounted,
		ve relative to a fixed axis, it is called		
	A)	simple gear train	B)	compound gear train
	C)	reverted gear train	D)	epicyclic gear train.
67.	Ina	a steady state forced vibrations, the damping coefficient.	e amp	olitude of vibrations at resonance is
	 A)	equal to	B)	directly proportional to
	C)	inversely proportional to	D)	independent of.
68.		cam follower generally used in auto		•
	A)	knife edge follower	B)	flat faced follower
	C)	spherical faced follower	D)	roller follower.
69.	•	ich of the following formulae is used		
-	A)	Euler's formula	B)	Rankine's formula
	C)	Johnson's straight line formula	D)	None of these.
70.	Ac	olumn is known as a long column if	•	· · · · ·
	A)	40	B)	50
	C)	70	ומ	100.
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The Coriolis component of acceleration is taken into account for 71. A) slider crank mechanism B) four bar chain mechanism quick return motion mechanism C) D) none of these. 72. Which one of the following is an inversion of slider crank mechanism ? Whitworth quick return mechanism A) B) Reciprocating I.C. engine mechanism Crank and slotted lever mechanism C) D) All of these. 73. The number of natural frequencies for a 3 rotor system will be A) 1 B) 2 (D) Ś 6. C) 74. The relation between no. of pairs (p) forming kinematic chain and the no. of links (l) is l = 2p - 2l = 2p - 3B) A) l = 2p - 5.C) l = 2p - 4D) In a cam follower system, dwell is the period in which 75. A) acceleration of the follower is zero B) velocity of the follower is constant C) velocity of the follower varies linearly velocity of the cam is zero. D) Which of the following is a pendulum type governor? 76. Watt governor A) B) Porter governor C) Hartnell governor D) None of these. In a Hartnell governor, if a spring of greater stiffness is used, then the 77. governor will be less sensitive A) B) more sensitive unaffected of sensitivity C) isochronous. D) X700x 5002 1501 [Turn over

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78.			es cont	inuously above and below the mean
	spe	ed, the governor is said to be		
	A)	stable	B)	unstable
	C)	isochronous	D}	hunt.
79.		en there is reduction in amplitude a aid to have	over ev	very cycle of vibration, then the body
	A)	free vibration	B)	forced vibration
	C)	damped vibration	D)	under-damped vibration.
80.	Lor	igitudinal vibrations are said to occ	ur whe	en the particles of a body move
	A)	perpendicular to its axis	B)	parallel to its axis
	C)	in a circle about its axis	D)	none of these.
81.	In t	he case of non-dilatant material, th	e valu	e of Poisson's ratio is
•	A)	0.25	B) -	0.35
	C)	0.50	- D)	0.60.
82.	In c	case of thin walled cylinder, if Poiss	ion's r	atio is 0.25, their ratio of volumetric
	stra	in to circumferential strain is		
	A)	8	B)	3
	C)	$\frac{16}{7}$	D)	$\frac{8}{7}$.
83,	The	point of contraflexure is a point wh	nere	
-	A)	shear force changes sign	B)	bending moment changes sign
	C)	shear force is maximum	D)	bending moment is maximum.
84.		beam is subjected to a constant b ar force will	ending	g moment along its length, then the
	A)	also have a constant value everyw	here a	long its length
	B)	be zero at all sections along the be	eam	
	C)	be maximum at the centre and zer	ro at th	ne ends
	D)	zero at the centre and maximum a	at the e	ends.
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85. If three kinematic links have plane motions, their instantaneous centre is straight line circle A) B) C) both (A) and (B) D} none of these. 86. Cam and follower is an example of instantaneous centres of rotation of **B**) ~ higher pair A) lower pair C) D) rolling pair. screw pair The number of links in Hart mechanism is 87. A) 6 8 B) ci 5 D) 4. 88. A mechanism with four links is inversion of the mechanism A) simple mechanism B) C) both (A) and (B) D) none of these. 89. Which of the following is an example of sliding pair? A) Piston and cylinder of a reciprocating steam engine B) Shaft with collars at both ends fitted into a circular hole Lead screw of a lathe with nut C) D) Ball and socket joint. 90. The mechanism forms a structure, when the number of degrees of freedom n is equal to A) 0 B) 1 C) 2 D) - 1. 91. Manometers measure unknown pressure by measuring liquid levels A) B) measuring height of liquid columns C) balancing the unknown force produced by pressure against a known force D) noting the deflection of a pointer. хжиж 5002 1501 Turn over

UBEL 16 The property of the system which opposes a change in the output variable is 92. power element load B A) C) resistance D) damping. 93. Factor of safety is given by which of the following expressions ? working stress working strain B) A) yield strain yield stress D) <u>yield strain</u> working strain yield stress C) working stress 94. A fixed beam of span 6 m carries a point load of 120 kN at its centre. The magnitude of fixing moments at the ends is 40 k N.m 90 k N.m A) B) C) 120 k N.m D) 45 k N.m. 95. In a thick cylinder pressurized from inside, the hoop stress is maximum at the centre of the wall thickness A) B) the outer radius the inner radius C) D) both the inner and the outer radii. 96. In the case of a circular section, the section modulus (Z) is given by the value $\frac{\pi d^3}{32}$ B) $\frac{\pi d^3}{64}$ A) $\frac{\pi d^2}{16}$ D) $\frac{\pi d^4}{64}$ C} 97. When a rectangular bar is subjected to a tensile stress, then the volumetric strain is equal to A) $\varepsilon \left[1-\frac{2}{m}\right]$ **B**) $\varepsilon \left[1 + \frac{2}{m}\right]$ D) $\varepsilon \left[2+\frac{1}{m}\right]$. C) $\varepsilon \left[2-\frac{1}{m}\right]$ ххж 5002

The total strain energy stored in a body is known as 98. A) impact energy B) resilience modulus of resilience. proof resilience D) C) 99. The variation of hoop stress across the thickness of a thick cylindrical shell is A) linear · B) parabolic a cubic curve C) D) constant. 100. At the neutral axis of a beam, the shear stress is żero A) B) minimum CÌ maximum D) infinity. 101. is a load measuring device whose electrical resistance changes under mechanical load. A) Piezo-electric transducer B) Strain gauge Bourdon gauge. C) **Proving ring** D) 102. McLeod gauge measures A) high pressures above 250 atm B) moderate pressures from 1 atm to 250 atm low and very low pressures from 0.01 µm of Hg to 50 mm Hg C) · · · ultra-low pressures below $0.01 \,\mu$ m of Hg. D) 103. The frequency response can be obtained analytically from the A) characteristic equation B) transfer functions of the components C) polar plot D) Bode diagram. XXXX 5002 1501 | Turn over

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104.	The	overshoot and the settling time as	re maxin	num with
•	A)	underdamped system	B)	overdamped system
	C)	critically damped system	D)	damped system.
105.	The	material used for resistance temp	perature	sensor is
	A)	copper	B)	nickel
	C)	platinum	D)	all of these.
106.	The	change in length of humidity sen	sitive ele	ments is measured by
	A)	hydrometer	B)	hygrometer
	C) .	psychrometer	D)	photometer.
107.	Erre	ors due to assignable causes are c	alled	
	A)	static errors	B)	systematic errors
	C)	calibration errors	D)	random crrors.
108.	Whi	ich gauge can be used to measure	pressur	e below 1 μm ?
	A)	Dead weight tester	B)	Pirani gauge
	C)	Ionization gauge	D)	McLeod gauge.
109.	Wh	ich of the following is not a negati	ve motiv	ating tool ?
	A}	Recognition	B)	Reprimand
	C)	Demotion	D)	Lay-off.
110.	Whi	ich of the following is not an exam	ple of in	ternal motivation ?
	A)	Fear of losing one's job		
	B)	The need to get the job of one's o	choice	
	C)	The illusion of self-determination	n and fre	eedom
	D)	A sense of accomplishment in do	oing a jo	b well.
111.	Аb	ody which partly absorbs and par	tly reflec	cts but does not allow any radiation
	to p	bass through, it is called		
	A)	specular	B)	gray
	C)	opaque	D)	none of these.
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112. The ratio of hydrodynamic to thermal boundary layer thickness

A) varies as one-third power of Prandtl number

B) varies as two-third power of Stanton number

C) varies as four-fifth power of Nusselt number

D) varies as root of Prandtl number.

113. Capacity of a hydroelectric plant in service in excess of the peak load is known as

- A) operating reserve B) spinning reserve
- C) cold reserve D) hot reserve.
- 114. Gas turbines for power generations are normally used
 - A) to supply base load requirements
 - B) to supply peak load requirements
 - C) to enable start thermal power plant
 - D) in emergency.

115. The maximum continuous power available from a hydroelectric plant under the most adverse hydraulic conditions, is known as

- A) base power B) firm power
- C) primary power D) secondary power.

116. A moderator generally used in nuclear power plant is

- A) graphite B) heavy water
- C) concrete D) graphite and concrete.

117. In natural uranium, the constituents of three naturally occurring isotopes are

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- A) $U_{234} = 0.006\%$, $U_{235} = 0.712\%$ & $U_{238} = 99.282\%$
- B) $U_{234} = 0.712\%$, $U_{235} = 0.006\%$ & $U_{238} = 99.282\%$
- C) $U_{234} = 99 \cdot 282\%$, $U_{235} = 0.006\%$ & $U_{238} = 0.712\%$
- D) $U_{234} = 0.006\%$, $U_{235} = 99.282\%$ & $U_{238} = 0.712\%$.

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118. The	118. The sensing element in the control system of nuclear reactors measures the					
••••	of the neutron flux in the	reacte	or.			
A)	temperature	B)	volume			
C)	density	D)	none of these.			
	e energy released during the fission ctron-volts is about	of one	e atom of uranium – 235 in million			
A)	100	B)	200			
C)	300	D)	400.			
	e smallest change in input signal playing is called	that	a measuring system is capable of			
A)	Precision	B)	Accuracy			
C)	Reliability	D)	Resolution.			
121. Ru	naway speed of a hydraulic turbine o	corres	ponds to the condition of			
A)	runner revolving freely without loa	d and	with the gates wide open			
B)	critical speed					
C)	breakage of runner					
D)	speed obtained when load is sudde	enly di	isconnected.			
122. Mu	iltistage centrifugal pumps are used	to obt	ain			
A)	high discharge	B)	high head			
C)	pumping of viscous fluids	D)	high efficiency.			
123. Im	pulse turbine is generally fitted					
A)	at the level of tail race		· · · · · · · · · · · · · · · · · · ·			
B)	little above the tail race					
C)	- slightly below the tail race					
D)	about 2.5 m above the tail race to	avoid	cavitation.			
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124. A radiation shield should have high B) absorptivity A) cmissivity emissive power. C) reflectivity D} 125. The overall heat transfer coefficient is the sum of all conductances A) B) sum of all resistances sum of the individual convection coefficients C) D) resistance due to the wall material. 126. The ratio between actual heat dissipated by the fin and the convection dissipation over the base area is called A) fin efficiency B) fin effectiveness total efficiency D) none of these. C) 127. The lowest thermal diffusivity is of A) iron B) lead D rubber. C) aluminium 128. The emissivity for a black body is A) 0 B) 0.5C) 0.75 D) 1. 129. A 20 mm thick plate of iron is in contact with 2 mm thick plate of copper making a composite thickness of 22 mm. The heat will flow A) from copper to iron B) from iron to copper from copper to iron if surface of copper is at higher temperature C) D) from copper to iron if open surface of copper is at lower temperature. 130. The unit of overall coefficient of heat transfer is A) $W/m^2 K$ B} W/m^2 W/mK W/m. C) D) хжж 5002 1501 [Turn over

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131. Across a normal shock

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- A) the entropy remains constant
- B) the pressure and temperature rise
- C) the velocity and pressure decrease
- D) the density and temperature decrease.

132. A flow through an expanding tube at constant rate is called

- A) steady uniform flow B) steady non-uniform flow
- C) unsteady uniform flow D) unsteady non-uniform flow.

133. A flow through a long pipe at constant rate is called

- A) steady uniform flow B) steady non-uniform flow
- C) unsteady uniform flow D) unsteady non-uniform flow.
- 134. According to equation of continuity

A) $w_1 a_1 = w_2 a_2$ B) $w_1 v_1 = w_2 v_2$

C)
$$a_1v_1 = a_2v_2$$
 D) $\frac{a_1}{v_1} = \frac{a_2}{v_2}$

135. The maximum hydraulic efficiency of an impulse turbine is

A)	$\frac{1+\cos\phi}{2}$	B)	$\frac{1-\cos\phi}{2}$
C)	$\frac{1+\sin\phi}{2}$	D)	$\frac{1-\sin\phi}{2}$.

136. Cavitation damage in turbine runner occurs near the

A) inlet on the convex side of blades

B) outlet on the convex side of blades

C) inlet on the concave side of blades

D) outlet on the concave side of blades.

137. In a rough turbulent flow in a pipe, the friction factor would depend on

- A) velocity of flow B) pipe diameter
- C) type of fluid flowing D) pipe condition and pipe diameter.

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138. If H is manometric height in metres, Q the discharge in m³/sec and η the overall efficiency of pump and ρ the density of fluid, then power to drive the centrifugal pump is equal to

all of these.

Α) <u>ρ<i>QH</i></u> 75η	B)	<u>рQHn</u> 75
C) $\frac{QH_{\eta}}{75}$	D)	<u>QH</u> 75η
. Bernoulli's equation is applie	d to	
A) venturimeter	B)	orifice meter

140. Francis turbine is

pitot tube

139.

C}

C)

A) radial flow turbine B} axial flow turbine

D)

- mixed flow turbine inward flow radial type turbine. D)
- 141. Oil separator is installed in a refrigeration cycle

A) before compressor

B) between compressor and condenser

- C) between condenser and evaporator
- between condenser and expansion valve. D)

142. One tonne of refrigeration (1 TR) means that the heat removing capacity is

- 210 kJ/min 21 kJ/min A) B)
- C) 420 kJ/min D) 620 kJ/min.

143. A condenser of refrigeration system rejects heat at the rate of 120 kW, while its compressor consumes a power of 30 kW. The coefficient of performance of the system will be

A) B) C) 3 D) 4. ххж 5002 1501

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144.	In a psychrometric process, the sensible heat added is 30 kJ/sec and the latent heat added is 20 kJ/sec. The sensible heat factor for the process will be				
	A)	0.3	B)	0.6	
	<u>C)</u>	0.67	D)	1.5.	
145.	Air	conditioning means			
•	A)	cooling	B)	heating	
	C)	dehumidifying	D)	all of these.	
146.	In a	an Electrolux refrigerator			
	A)	ammonia is absorbed in water			
	B)	ammonia is absorbed in hydroger	ı	,	
	C)	ammonia is evaporated in hydrog	en		
	D)	hydrogen is absorbed in water.			
147.	The	formation of frost on cooling coils in	n a rei	frigerator	
	A)	increases heat transfer	B)	improves C.O.P. of the system	
	C)	increases power consumption	D)	reduces power consumption.	
148.	ΑU	I-tube Differential Manometer			
	A)	is used upright if the pressure diff	erence	e is small	
	B)	cannot be inclined at any angle			
	C)	must be fitted with a well for the s	ake of	accuracy	
	D)	is used inverted if the pressure dif	ferenc	e is small.	
149.	The	e coefficient of discharge (C_d) in ter	ms of	C_{ν} and C_{c} is	
		$C_d = \frac{C_v}{C_c}$	B)	$C_d = \frac{C_c}{C_v}$	
	C)	$C_d = C_v \times C_c$	D)	independent of C_{ν} and C_{c} .	

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150.	D. The sonic velocity in a fluid medium is directly proportional to				
•	A)	Mach number	B)	pressure	
	C) (square root of temperature	D) '	none of these.	
151.	The	critical pressure ratio for gases is			
•	A)	0.528	B)	0.546	
	C)	0.577	D)	0.582.	
152.	Higl	h air-fuel ratio in gas turbine			
	A)	increases power output	B)	improves thermal efficiency	
	C)	reduces exhaust temperature	D)	does not damage turbine blades.	
153.	In a	jet engine, the compression varies	as the	of the speed.	
	A)	cube	B)	square	
	C)	square root	D)	cube root.	
154.	For	speed above 3000 km/hr, it is mon	e adva	ntageous to use	
	A)	Turbo-Jet engine	B)	Ram-Jet engine	
	C)	Pulse-Jet engine	D)	Turbo-Prop engine.	
155.	Prop	oulsion efficiency of which of the fol	lowing	orders is obtained in practice ?	
	A)	34%	B)	50%	
	C)	60%	D)	72%.	
15 6 .	În o	rder to increase thermal efficiency o	of aircr	aft jet engine, use is made of	
	A)	regeneration	В)	reheating	
	C)	intercooler	D)	high temperature and pressure.	
157.	Sen	sible Heat Factor is given by			
	A)	Latent heat Sensible heat + Latent heat	B)	Sensible heat + Latent heat Latent heat	
	, C)	Sensible heat Sensible heat + Latent heat	D)	Latent heat Sensible heat	
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158. Bell-Coleman cycle consists of

A) two constant volume processes and two isentropic processes

B) two constant pressure processes and two isentropic processes

C) two constant volume processes and two isothermal processes

D) two constant pressure processes and two isothermal processes.

159. In vapour compression refrigeration cycle, heat is rejected by the refrigerant in

A)	compressor	B)	condenser
	•		·.
C}	expansion valve	D)	evaporator.

160. The freezing point of R-12 is

A)	– 86·6° C	B)	– 95·2° C
C)	– 107·7° C	D)	– 135•8° C.

161. The process of breaking up of a liquid into fine droplets by spraying is called

A) vaporization	B)	carburation
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C) ionization D) automisation.

162. Compression loss in I.C. engines occurs due to

A) leaking piston rings B) use of thick head gasket

C) clogged air-inlet slots D) all of these.

163. The temperature of interior surface of cylinder wall in normal operation is not allowed to exceed

A}	80° C	B)	120° C
			•
C)	180° C	D)	240° C.

164. The carburetor provides the correct quality of air-fuel mixture during

A) starting B) idling

C) acceleration D) all conditions.

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(SPACE FOR ROUGH WORK)

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