ر. ا	eco.il	Frorman	end	Technical	17857
4				•	

DO	1	 1	6	_	1	0	.سر	/
-	-			T٦	73	3) 1	133	

Booklet Series

]	D	

i		
Register		
Number		

2011

MECHANICAL AND PRODUCTION ENGINEERING

Time Allowed: 3 Hours]

[Maximum Marks : 300

UDEI

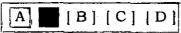
Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

- 1. This Bookiet has a cover (this page) which should not be opened till the invigilator gives signal to open it at the commencement of the examination. As soon as the signal is received you should tear the right side of the booklet cover carefully to open the booklet. Then proceed to answer the questions.
- 2. This Question Booklet contains 200 questions.
- 3 Answer all questions.

ŀĖ

- 4. All questions carry equal marks.
- 5. The Test Booklet is printed in four series e.g. A B C or D (See Top left side of this page). The candidate has to indicate in the space provided in the Answer Sheet the series of the booklet. For example, if the candidate gets A series booklet, he/she has to indicate in the side 2 of the Answer Sheet with Blue or Black lnk Ball point pen as follows:



- 6. You must write your Register Number in the space provided on the top right side of this page. Do not write anything else on the Question Booklet.
- 7. An Answer Sheet will be supplied to you separately by the Invigilator to mark the answers. You must write your Name, Register No. and other particulars on side I of the Answer Sheet provided, failing which your Answer Sheet will not be evaluated.
- 8. You will also encode your Register Number, Subject Code etc., with Blue or Black ink Ball point pen in the space provided on the side 2 of the Answer Sheet. If you do not encode properly or fail to encode the above information, your Answer Sheet will not be evaluated.
- 9. Each question comprises four responses (A), (B), (C) and (D). You are to select ONLY ONE correct response and mark in your Answer Sheet. In case you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.
- 10. In the Answer Shect there are **four** brackets [A] [B] [C] and [D] against each question. To answer the questions you are to mark with Ball point pen ONLY ONE bracket of your choice for each question. Select one response for each question in the Question Booklet and mark in the Answer Sheet. If you mark more than one answer for one question, the answer will be treated as wrong. e.g. If for any item, (B) is the correct answer, you have to mark as follows:

[A] [C] [D]

- 11. You should not remove or tear off any sheet from this Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the examination. After the examination is concluded, you must hand over your Answer Sheet to the Invigilator. You are allowed to take the Question Booklet with you only after the Examination is over.
- 12. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.
- Do not tick-mark or mark the answers in the Question Booklet.
- 14. The last page of the Question Booklet can be used for Rough Work.

-	## W	~
-	-,-	

XXXX 5002

1501

Turn over

1.	For	ship vessel industry which of the	followin	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	excessive	e work
,	B)	structure is rigid		
	C)	communication delays occur		
	D) .	all of these.		
3.	The	chart which is not used in motion	n study i	is
	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	S	
	A)	line organisation	•	
	B)	functional organisation		
	C)	line and staff organisation		
	D)	line, staff and functional organis	ation.	•
6.		•		nagement which affect the entire
·		anisation are decis		
	A)	programmed	B)	routine
سيني	C)	certainty	D)	non-programmed.
I	711	жжж 5002	1501	Turn over

7.	The	short-term goals of supervisory leve	l man	agers are called goals.
•	A)	operational	B)	tactical :
	C)	strategic	D)	programme.
8.	Proc	luctivity is given by		.4
	A)	Input Output	B)	Output Input
•	C)	Efficiency Effectiveness	D) .	Effectiveness × Efficiency.
9.	The	chronological sequence of required	action	s is called a
	A)	Rule	B)	Programme
	C)	Procedure	D)	Premise.
10.	The	ory X and Theory Y were developed	by	•
	- A)	Abraham Maslow	B)	Peter Drucker
	C)	Elton Mayo	D)	Douglas McGregor.
11.		ch of the following types of gau	ige ha	as gauging sections combined on
	A)	Combination gauge	B)	Limit gauge
	Ć)	Go and NoGo gauge	D)	Progressive gauge.
12.	Con	stant measuring pressure in micror	neter	screw gauges is ensured by
	A)	locknut	B)	barrel and thimble
	C)	ratchet	D)	spanner.
13.	It is	desirable to handle the slip gauges	s with	a cloth or chamois leather in order
	to			· · ·
	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	gaug	es does not come out.
	5000			

14.	Eden-Rolt	comparator	is a	popular	instrument	for	the

- A) calibration of slip gauges
- B) absolute measurement of length of slip gauges
- C) measurement of flatness
- D) measurement of angles.

15. Money required for the purchase of stores, payment of wages etc. is known as

A) Block capital

B) Reserved capital

C) Authorised capital

D) Working capital.

16. In A-B-C control policy, maximum attention is given to

- A) those items which consume money
- B) those items which are not readily available
- C) those items which consume more money
- D) those items which are in more demand.

17. Emergency rush order can be pushed more effectively in

A) job production

- B) automatic production
- C) continuous production
- D) intermittent production.

18. In time study rating factor is equal to (standard time = t_1 , selected time = t_2 and 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.

20.	main techniques?				
	A)	Method study and work measuren	nent		
	B)	Method study and time study			
	C)	Time study and work measuremen	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?	d for 1	preparing parts having large curved	
	A)	Hot machining	B)	Ultrasonic machining	
	C)	ECM process	D)	Chemical milling.	
23.	Thr	ead grinding requires work speed fro	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	ness,	tool marks and other minor defects	
	A}	lapping	B)	høning	
	C)	broaching	D)	reaming.	
25.		system is not an 'island	of aut	omațion'.	
	A)	Computer Numerical Control	B)	Robotic	
	C)	Automated storage / Retrieval	D)	Flexible Manufacturing.	
26.	The equipment that measures surface roughness is				
	A)	Profile projector	B)	Laser interferometer	
	C)	Profile gauge	D)	Profilometer.	
	5002		501	•	

27.	Exp	pressing a dimension as $\frac{36 \cdot 2}{36 \cdot 0}$ mm i	s the	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.		ich of the following gives an idea at all variation in the input signal (qua		
	A)	Readability	B)	Accuracy
•	C)	Sensitivity	D)	Precision.
30.	Par	asitic error is caused due to	•	
	A)	improper use of measuring instrui	nent	
	В)	wrong design of instrument	•	
	C)	changes in ambient conditions		
	D)	errors in computation.		
31.	The	cutting speed of a drill depends up	on the	
	A)	material of drill	B)	type of material to be drilled
	C).	quality of surface finish desired	D)	all of these.
3 2 .	A tv	vist drill is a / an		
	A)	side cutting tool	B)	front cutting tool
	C)	end cutting tool	D)	none of these.
33.	Dril	lling is an example of		
	A)	simple cutting	B)	uniform cutting
	C)	orthogonal cutting	D)	oblique cutting.
		•		

жжж 5002

34.	. Which of the following is not the part of a shaper?				
	A)	Clapper box	B)	Ram	
	C)	Table	D)	Cross slide.	
35.	The is	tool used for drilling holes of large	diame	eter (diameter greater than 80 mm)	
	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 se	eating	of bolt heads and nuts is	
	A)	spot facing	B)	counter sinking	
	C)	reaming	D)	counter boring.	
37.		work-holding device used for finish tly turned on the lathe is	ning tl	ne work which has been bored and	
	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 glass.	It cou	ld best be done by	
	A)	laser drilling			
	B)	plasma arc drilling			
	C)	ultrasonic method		•	
	D)	electro-chemical discharge method	i.	•	
39.	The	abrasive slurry used in ultrasonic r	nachir	ning contains fine particles of	
	A)	aluminium oxide	B)	boron carbide	
	C)	silicon carbide	D)	any one of these.	
40.	Buf	fing wheels are made of			
	A)	softer metals	B) ·	cotton fabric	
	C)	carbon	D)	graphite.	
				•	

1501

41.	In w	form gears, the angle between the	e tanger	nt to the pitch helix and an element
	of th	e cylinder is known as		
E CO	A)	helix angle	B)	pressure angle
l XI	C)	pitch lead angle	. D)	none of these.
42.	The	rubbing speed of worm gear is sa	id to be	
1	A)	2.5 m/s	B)	5 m/s
į	C)	7.5 m/s	D)	12.5 m/s.
43.	A V-	belt should touch the pulley groot	ve at the	e
: 1	A }-	sides only	B)	bottom only
4 4	C)	bottom and sides	D)	one side only.
44.	The	type of gears used for noise-free p	ower tr	ansmission is
1	A)	spur gears	B)	helical gears
	C)	involute gears	D)	epicyclic gears.
45.	The	gears used to connect two non-in	tersecti	ng non-coplanar shafts are
	· A)	bevel gears	B)	helical gears
	C)	spiral gears	D)	spur gears.
46.	The	surface of the gear tooth below th	e pitch	surface is known as
→ ,	A)	flank	B)	dedendum
ţ	C)	addendum	D)	face.
47.	Find	the correct statement:		
	A)	F_n accelerates the chip upwards		
1 48	B)	F_n accelerates but F_s retards the	chip eq	ually
* 5	C)	F_s retards the chip but N accelerates	ates equ	ally
American des derres.	D) .	All the four forces together keep	the chip	in equilibrium.
! ¿	$F_n =$	perpendicular to shear plane, F_s	= parall	el to shear plane, F = parallel to tool
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	chip	interface, $N = normal$ to tool chip	interfac	ce.
H. [5002		1501	Turn over

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	ling varies from
	A)	5 to 10 m/min	B)	10 to 20 m/min
	C)	20 to 30 m/min	Ď)	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.	A co	onnecting rod is designed as a		
	A)	long column	B)	short column
	C)	strut	D)	none of these.
52 .	A cc	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 o	at of the following?
	A)	Spiral	B)	Leaf
,	C)	Helical	D)	Conical.
XXXX	5002	. <u>.</u>	501	

- 56. The bearing efficiency of a riveted joint is given by
 - A) $\frac{p-d_0}{p}$

B) $\frac{p}{d_0}$

C) $\frac{d_0}{p}$

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

C) clearance

D) working depth.

63.	The frictional torque transmitted by a disc 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.		primary unbalanced force is maximum.	mum	in one revolution of
	A)	twice	B)	four times
	C)	eight times	D)	sixteen times.
66.		gear train, when the axes of the sl we relative to a fixed axis, it is called	nafts,	over which the gears are mounted,
	A)	simple gear train	B)	compound gear train
	C)	reverted gear train	D)	epicyclic gear train.
67.		a steady state forced vibrations, the	amp	litude of vibrations at resonance is
		damping coefficient.		
	A)	equal to	B)	directly proportional to
	C)	inversely proportional to	D)	independent of.
68.	The	cam follower generally used in auto	mobile	e engines is
	A)	knife edge follower	B)	flat faced follower
	C)	spherical faced follower	D)	roller follower.
69.	Whi	ich of the following formulae is used	in des	signing a connecting rod?
	A)	Euler's formula	B)	Rankine's formula
	C)	Johnson's straight line formula	D)	None of these.
70.	A co	olumn is known as a long column if	the slo	enderness ratio is
	A)	40	B)	50
	C)	70	ומ	100.
				•

71.	The	Coriolis component of acceleration	is tak	en into account for
:	A)	slider crank mechanism	B)	four bar chain mechanism
1 1	C)	quick return motion mechanism	D)	none of these.
72.	Wh	ich one of the following is an invers	ion of	slider crank mechanism ?
	A)	Whitworth quick return mechanis	m	
	B)	Reciprocating I.C. engine mechan	ism	
: .	C)	Crank and slotted lever mechanis	m	चु -
	D)	All of these.		
73.	The	number of natural frequencies for	a 3 rot	or system will be
: :	A)	1	B)	2
	C)	3	D)	6.
74.		relation between no. of pairs (p is (l) is) form	ing kinematic chain and the no. of
	A)	l=2p-2	B)	l=2p-3
	C)	l=2p-4	D)	l=2p-5.
75.	In a	cam follower system, dwell is the p	eriod i	n which
	A)	acceleration of the follower is zero		
	B)	velocity of the follower is constant		
	C)	velocity of the follower varies linear	rly	
	D)	velocity of the cam is zero.		
76.	Whi	ich of the following is a pendulum ty	pe go	vernor?
	A)	Watt governor	B)	Porter governor
	C)	Hartnell governor	D)	None of these.
77.		a Hartnell governor, if a spring ernor will be	of gr	eater stiffness is used, then the
	A)	less sensitive	B)	more sensitive
	C)	unaffected of sensitivity	D)	isochronous.
XXXX	5002		1501	[Turn over

78.	When the speed of the engine fluctuates continuously above and below the mean speed, the governor is said to be			
	A)	stable	B)	unstable
	C)	isochronous	D)	hunt.
79.	Wh	en there is reduction in amplitude o	ver ev	ery cycle of vibration, then the body
	is s	aid to have		
	A)	free vibration	B)	forced vibration
	C)	damped vibration	D)	under-damped vibration.
80.	Lon	gitudinal vibrations are said to occu	r whe	n 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.	În t	he case of non-dilatant material, the	value	e of Poisson's ratio is
	A)	0.25	B) -	0.35
	C)	0.50	· D)	0.60.
82.	In c	ease of thin walled cylinder, if Poisso	on's ra	atio is 0.25, their ratio of volumetric
	strain to circumferential strain is			
	A)	8	B)	3
	C)	$\frac{16}{7}$	D)	$\frac{8}{7}$.
83.	The	point of contraflexure is a point who	ere	
-	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 be ar force will	nding	moment along its length, then the
	A)	also have a constant value everywh	ere al	ong its length
	B)	be zero at all sections along the bea	am	•
	C)	be maximum at the centre and zero	at th	e ends
	D)	zero at the centre and maximum at	the e	nds.
XXXX	5002]	501	

KOKUKOK Î	5002		i01	Turn over
	D)	noting the deflection of a pointer.		
-	C)	balancing the unknown force produ	ced by	y pressure against a known force
	B)	measuring height of liquid columns		
	A)	measuring liquid levels		
91.	Man	ometers measure unknown pressure	by by	
	C)	2	D)	- 1.
	A)	0	B)	1
~ · · ·	equa		a ciic	mamour or avgrees or needon a to
90.	·	mechanism forms a structure, when	n the	number of degrees of freedom n is
	D)	Ball and socket joint.		
	C)	Lead screw of a lathe with nut	u mto	a circular note
	B)	Shaft with collars at both ends fitte		·
117.	A)	Piston and cylinder of a reciprocating	_	
89.	C)	both (A) and (B) ch of the following is an example of s	D)	
	A)	•	B)	none of these.
88.		echanism with four links is simple mechanism	וסו	inversion of the mechanism
00	C)	5	D)	4.
	A)	8	B)	6
87.		number of links in Hart mechanism		
	C)	screw pair	D)	rolling pair.
	A)	lower pair	B) "	higher pair
86.	Can	and follower is an example of insta	ntane	
	C)	both (A) and (B)	D)	none of these.
	A)	straight line	B)	circle
85.	If three kinematic links have plane motions, their instantaneous centre is			

- 92. The property of the system which opposes a change in the output variable is
 - A) load

B) power element

C) resistance

- D) damping.
- 93. Factor of safety is given by which of the following expressions?
 - A) working stress yield stress

B) working strain yield strain

C) yield stress working stress

- D) <u>yield strain</u> working strain
- 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
 - A) 40 k N.m

B) 90 k N.m

C) 120 k N.m

- D) 45 k N.m.
- 95. In a thick cylinder pressurized from inside, the hoop stress is maximum at
 - A) the centre of the wall thickness
- B) the outer radius

C) the inner radius

- 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
 - A) $\frac{\pi d^3}{32}$

B) $\frac{\pi d^3}{64}$

C) $\frac{\pi d^2}{16}$

- D) $\frac{\pi d^4}{64}$
- 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) $\varepsilon \left[1 + \frac{2}{m}\right]$

C) $\varepsilon \left[2-\frac{1}{m}\right]$

D) $\varepsilon \left[2+\frac{1}{m}\right]$.

[Turn over

98.	The total strain energy stored in a body is known as			
	A)	impact energy	B)	resilience
	C)	proof resilience	D)	modulus of resilience.
99.	The	variation of hoop stress across the	thickn	ess of a thick cylindrical shell is
	A)	linear	B)	parabolic
; ;	C)	a cubic curve	D)	constant.
100.	At t	he neutral axis of a beam, the shear	stres	s is
	A)	zero	B)	minimum
1,	C)	maximum	D)	infinity.
101.	under mechanical load.			
	A)	Piezo-electric transducer	B)	Strain gauge
	C)	Proving ring	D)	Bourdon gauge.
102.	McL	eod gauge measures		
1	A)	high pressures above 250 atm		
	B)	moderate pressures from 1 atm to	250 at	tm
	C)	low and very low pressures from 0-	01 μ m	of Hg to 50 mm Hg
1	D)	ultra-low pressures below $0.01\mum$	of Hg.	•
103.	The	frequency response can be obtained	analy	tically from the
·	A)	characteristic equation		
	B)	transfer functions of the componen	ts	
r	C)	polar plot		
	D)	Bode diagram.		·

1501

XXXX 5002

104.	The	overshoot and the settling time are	maxin	num with
•	A)	underdamped system	B)	overdamped system
	C)	critically damped system	D)	damped system.
105.	The	material used for resistance temperature	ature	sensor is
	A)	copper	B)	nickel
	C)	platinum	'D)	all of these.
106.	The	change in length of humidity sensiti	ive ele	ments is measured by
	A)	hydrometer	B)	hygrometer
	C) .	psychrometer	D)	photometer.
107.	Erro	ors due to assignable causes are call	ed	
	A)	static errors	B)	systematic errors
	C)	calibration errors	D)	random errors.
108.	Whi	ch gauge can be used to measure pr	essur	e below 1 μm?
	A)	Dead weight tester	B)	Pirani gauge
	C)	Ionization gauge	D)	McLeod gauge.
109.	Whi	ch of the following is not a negative	motiva	ating tool?
•	A)	Recognition	B)	Reprimand
	C)	Demotion	D)	Lay-off.
110.	Whi	ch of the following is not an example	e of in	ternal motivation ?
	A)	Fear of losing one's job		
	B)	The need to get the job of one's cho	ice	
	C)	The illusion of self-determination a	nd fre	edom
	D)	A sense of accomplishment in doin	g a jol	b well.
111.		ody which partly absorbs and partly	reflec	ets but does not allow any radiation
	to p	ass through, it is called		•
	A)	specular	B)	gray
	C)	opaque	D)	none of these.
NAMES	5002	i) ii	501	

112. The ratio of hydrodynamic to thermal boundary layer thickness A) varies as one-third power of Prandtl number varies as two-third power of Stanton number B) varies as four-fifth power of Nusselt number C) varies as root of Prandtl number. D) 113. Capacity of a hydroelectric plant in service in excess of the peak load is known as spinning reserve A) operating reserve B) Cì cold reserve D) hot reserve. 114. Gas turbines for power generations are normally used to supply base load requirements A) to supply peak load requirements B) C) to enable start thermal power plant in emergency. D) 115. The maximum continuous power available from a hydroelectric plant under the most adverse hydraulic conditions, is known as B) firm power A) base power primary power D) secondary power. CI 116. A moderator generally used in nuclear power plant is A) graphite B) heavy water graphite and concrete. C) concrete D) 117. In natural uranium, the constituents of three naturally occurring isotopes are $U_{234} = 0.006\%$, $U_{235} = 0.712\%$ & $U_{238} = 99.282\%$ A) $U_{234} = 0.712\%$, $U_{235} = 0.006\%$ & $U_{238} = 99.282\%$ B) C) $U_{234} = 99.282\%$, $U_{235} \approx 0.006\%$ & $U_{238} = 0.712\%$ D) $U_{234} = 0.006\%$, $U_{235} = 99.282\%$ & $U_{238} = 0.712\%$.

хжж 5002

118.	The	sensing element in the control sy	stem	of nuclear reactors measures the
		of the neutron flux in the	reacto	r.
	A)	temperature	B)	volume
	C)	density	D)	none of these.
119.	The	energy released during the fission	of one	atom of uranium - 235 in million
	elect	ron-volts is about		
	A)	100	B)"	200
	C)	300	D)	400.
120.		smallest change in input signal laying is called	that a	measuring system is capable of
	A)	Precision	B)	Accuracy
	C)	Reliability	D)	Resolution.
121.	Run	away speed of a hydraulic turbine c	orresp	onds to the condition of
,	A)	runner revolving freely without load	d and	with the gates wide open
•	B)	critical speed	•	
	C)	breakage of runner		
	D)	speed obtained when load is sudde	nly di	sconnected.
122.	Mult	tistage centrifugal pumps are used t	o obta	in
	A)	high discharge	B)	high head
	C)	pumping of viscous fluids	D)	high efficiency.
123.	Imp	ulse 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 a	avoid o	cavitation.

1501

124.	A ra	diation shield should have high		•
	A)	emissivity	B)	absorptivity
٠	C)	reflectivity	D)	emissive power.
125.	The	overall heat transfer coefficient is	the	
	A)	sum of all conductances		•
	B)	sum of all resistances		
	C)	sum of the individual convection	coefficie	ents
8	D)	resistance due to the wall materia	ıl.	
126.		ratio between actual heat dis ipation over the base area is called	_	by the fin and the convection
	A)	fin efficiency	B)	fin effectiveness
	C)	total efficiency	D)	none of these.
127.	The	lowest thermal diffusivity is of		
	A)	iron	В)	lead
	C)	aluminium	D)	rubber.
128.	The	emissivity for a black body is		
	A)	0	B)	0.5
	C)	0.75	D)	1.
129.		mm thick plate of iron is in conta mposite thickness of 22 mm. The l		2 mm thick plate of copper making
	A)	from copper to iron		
,	B)	from iron to copper		
	C)	from copper to iron if surface of co	opper is	s at higher temperature
	D)	from copper to iron if open surfac	e of cop	pper is at lower temperature.
130.	The	unit of overall coefficient of heat tr	ansfer i	is
,	A)	W/m ² K	B)	W/m²
. :	C)	W/mK	D)	W/m.
жжей [5002]	1501	[Turn over

- 131. Across a normal shock
 - 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
 - $A) \quad w_1 a_1 = w_2 a_2$

B) $w_1 v_1 = w_2 v_2$

 $C) \qquad a_1 v_1 = a_2 v_2$

- $D) \qquad \frac{a_1}{v_1} = \frac{a_2}{v_2} \ .$
- 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.

138. If H is manometric height in metres, Q the discharge in m^3/sec and η the overall

	effic	ciency of pump and ρ the density	of fluid	, then power to drive the centrifuga
	pur	np is equal to		
	A)	<u>ρQH</u> 75η	В)	<u>ρQHη</u> 75
ı	C)	<u>QHη</u> 75	D)	<u>QH</u> 75η
139.	Ber	noulli's equation is applied to		
	A)	venturimeter	В)	orifice meter
	C)	pitot tube	D)	all of these.
140.	Fra	ncis turbine is		•
	A)	radial flow turbine	B)	axial flow turbine
	C)	mixed flow turbine	D)	inward flow radial type turbine.
141.	Oil	separator is installed in a refrigera	tion cyc	ele
	A)	before compressor		
-	В)	between compressor and conden	ser	
	C)	between condenser and evaporat	or	
:	D)	between condenser and expansion	n valve	
142.	One	tonne of refrigeration (1 TR) mean	ns that t	the heat removing capacity is
	A)	21 kJ/min	B)	210 kJ/min
	C)	420 kJ/min	D)	620 kJ/min.
143.	com	· - -	-	eat at the rate of 120 kW, while its
٠	A)	1/4	B)	$\frac{1}{3}$
: .	C)	3	D)	4.
XXXX	5002]	1501	Turn over

- 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

C) 0.67

D) 1.5.

- 145. Air conditioning means
 - A) cooling

B) heating

C) dehumidifying

- D) all of these.
- 146. In an Electrolux refrigerator
 - A) ammonia is absorbed in water
 - B) ammonia is absorbed in hydrogen
 - C) ammonia is evaporated in hydrogen
 - D) hydrogen is absorbed in water.
- 147. The formation of frost on cooling coils in a refrigerator
 - A) increases heat transfer
- B) improves C.O.P. of the system
- C) increases power consumption
- D) reduces power consumption.
- 148. A U-tube Differential Manometer
 - A) is used upright if the pressure difference is small
 - B) cannot be inclined at any angle
 - C) must be fitted with a well for the sake of accuracy
 - D) is used inverted if the pressure difference is small.
- 149. The coefficient of discharge (C_d) in terms of C_{ν} and C_c is
 - A) $C_d = \frac{C_v}{C_c}$

B) $C_d = \frac{C_c}{C_n}$

C) $C_d = C_v \times C_c$

D) independent of C_{ν} and C_{c} .

150.	The	sonic velocity in a fluid medium is	s directl	y 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.	Hig	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	s as the	of the speed.
	A)	cube	B)	square
	C)	square root	D)	cube root.
154.	For	speed above 3000 km/hr, it is mo	re adva	ntageous to use
	A }	Turbo-Jet engine	B)	Ram-Jet engine
	C)	Pulse-Jet engine	D)	Turbo-Prop engine.
155.	Proj	pulsion efficiency of which of the fo	llowing	orders is obtained in practice?
	A)	34%	B)	50%
	C)	60%	D)	72%.
156.	Ìn o	rder to increase thermal efficiency	of aircr	aft jet engine, use is made of
-	A)	regeneration	ㅂ)	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
жжж [5002		1501	[Turn over

158.	Bell-	ll-Coleman cycle consists of				
	A)	two constant volume processes and two isentropic processes				
	B)	two constant pressure processes and two isentropic processes				
	C)	c) two constant volume processes and two isothermal processes				
	D)	two constant pressure processes ar	nd two	isothermal processes.		
159.	In va	apour compression refrigeration cycl	le, hea	at 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 in	ito fin	e droplets by spraying is called		
	A)	vaporization	B)	carburation		
	C)	ionization	D)	automisation.		
162.	Con	pression loss in I.C. engines occurs	due t	o .		
	A)	leaking piston rings	B)	use of thick head gasket		
	C)	clogged air-inlet slots	D) .	all of these.		
163.		temperature of interior surface of wed to exceed	cylind	der wall in normal operation is not		
	A)	80° C	B)	120° C		
	C)	180° C	D)	240° C.		
164.	The	carburetor provides the correct qua	lity of	air-fuel mixture during		
	A)	starting	B)	idling		
	C)	acceleration	D)	all conditions.		
XXXX	5002] · [ī	501			

(SPACE FOR ROUGH WORK)

(SPACE FOR ROUGH WORK)