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**Answer-key & Solution**

SSC JE (Mechanical)  
MOCK -(139)  
Date:- 19.5.2018

1. A	26 D	51 B	76 C	101. B	126. C	151. D	176. B
2. A	27 C	52 B	77 B	102. D	127. A	152. D	177 D
3. B	28 B	53 C	78 B	103. D	128. B	153. C	178 B
4. C	29 C	54 B	79 C	104. A	129. A	154. D	179 D
5. D	30 B	55 D	80 D	105. B	130. D	155. A	180 B
6. C	31 C	56 C	81 A	106. D	131. B	156. C	181 D
7. C	32 A	57 C	82 B	107. B	132. A	157. D	182 C
8. B	33 C	58 C	83 D	108. D	133. A	158. B	183 A
9. D	34 B	59 C	84 B	109. C	134. A	159. A	184 B
10. C	35 C	60 D	85 C	110. C	135. B	160. D	185 B
11. C	36 C	61 D	86 B	111. D	136. D	161. B	186 A
12. D	37 B	62 B	87 A	112. A	137. D	162. A	187 D
13. C	38 D	63 A	88 C	113. A	138. B	163. D	188 D
14. C	39 B	64 A	89 B	114. B	139. D	164. A	189 C
15. C	40 A	65 C	90 A	115. B	140. A	165. C	190 B
16. A	41 C	66 C	91 A	116. D	141. A	166. A	191 D
17. B	42 B	67 C	92 A	117. B	142. B	167. C	192 C
18. B	43 D	68 C	93 A	118. C	143. B	168. D	193 A
19. A	44 A	69 C	94 C	119. A	144. D	169. B	194 D
20. B	45 D	70 A	95 D	120. D	145. C	170. A	195 B
21. B	46 A	71 A	96 B	121. D	146. D	171. A	196 A
22. A	47 B	72 B	97 C	122. D	147. C	172. A	197 A
23. A	48 C	73 B	98 D	123. B	148. B	173. C	198 D
24. A	49 D	74 C	99 A	124. D	149. B	174. D	199 D
25. C	50 B	75 D	100 D	125. B	150. C	175. B	200 A

**Note :** If your opinion differ regarding any answer, please message the mock test and Question number to 9560620353

**Note :** If you face any problem regarding result or marks scored, please contact : 9313111777

**SOLUTION SSC JE (Mechanical) MOCK TEST no. 139**

1. (A) As, Internal security is an issue of Ministry of Home Affairs. Similarly, **Company** is an issue of Ministry of corporate Affairs.
2. (A) As, the unit of Force is Newton. Similarly, the unit of Sound is **Decibel**.
3. (B) EVENT is written in alphabetical order i.e. EENTV Similarly, REASON is written in alphabetic order i.e. **AENORS**
4. (C) As,  $(7 + 3)^2 = 100$   
Similarly,  
 $(1 + 8)^2 = 81$
5. (D) Except **Son**, all are tributaries of Yamuna.
6. (C)  $(13)^2 = 169 \Rightarrow$  reverse the digit = 961  
 $(16)^2 = 256 \Rightarrow$  reverse the digit = 652  
 **$(15)^2 = 225 \Rightarrow$  reverse the digit = 522**  
 $(26)^2 = 676 \Rightarrow$  reverse the digit = 676
7. (C) 

B	I	P
↑	↑	↑
+7	+7	
E	L	S
↑	↑	↑
+7	+7	

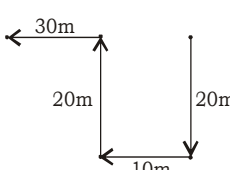
G	N	U
↑	↑	↑
+7	+7	
T	A	G
↑	↑	↑
+7	+6	
8. (B) 

16	64
↓	↓
$2^4$	$4^3$

625	81
↓	↓
$5^4$	$3^4$
9. (D) Cause
10. (C)
11. (C) 

1	3	10	41	206
↑	↑	↑	↑	↑
$\times 2+1$	$\times 3+1$	$\times 4+1$	$\times 5+1$	
12. (D) 

9	20	44	94	196
↑	↑	↑	↑	↑
$\times 2+2$	$\times 2+4$	$\times 2+6$	$\times 2+8$	
13. (C) 

A	Z	K	H	S	R	O	L	Y	V	E	F
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
			+7			+7			+7		+7
			-7			-7			-7		-7
			+7			+7			+7		+7
14. (C)  $\oplus M \xrightarrow{\text{Brother}} N \ominus \xrightarrow{\text{Brother}} B \oplus$   
 $\uparrow$  Brother  
D  $\swarrow$  Sister
15. (C) **←...40m West...→**  

16. (A)  $3 + 1^3 = 4$   
 $5 + 3^3 = 32$   
 $7 + 6^3 = 223$
17. (B)  $(6^2 + 8^2)^{1/2} = 10$   
 $(8^2 + 15^2)^{1/2} = 17$   
 $(20^2 + 21^2)^{1/2} = 29$
18. (B)  $(8)^2 + 36 = 100$   
 $(4)^2 + 20 = 36$   
 **$(6)^2 + 64 = 100$**

19. (A)

20. (B) 

Bags	Papers	Pages
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I. False

II. False

26. (D) As, 

E	H	O	T
↓	↓	↓	↓
+4	-5	+6	-7
I	C	U	M

Similarly, 

K	M	Z	E
↓	↓	↓	↓
+4	-5	+6	-7
O	H	F	X

27. (C) As, 

9	28
↓	↓
$2^3+1$	$(2+1)^3+1$

Similarly, 

217	344
↓	↓
$6^3+1$	$(6+1)^3+1$

28. (B) Sodium is represented by Na. Similarly, Potassium is represented by **K**.

29. (C) 

3	5	6	7	8	4	6	7	8	9
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
+2	+1	+1	+1	+2	+1	+1	+1	+1	

2	5	6	7	8	1	3	4	5	6
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
+3	+1	+1	+1	+2	+1	+1	+1	+1	

30. (B) Except **Gas Stoves**, all others are electronic items

31. (C) 

S	N	J	G	W	R	N	K
↑	↑	↑	↑	↑	↑	↑	↑
-5	-4	-3	-5	-4	-3	-5	-4

E	Z	W	S	J	E	A	X
↑	↑	↑	↑	↑	↑	↑	↑
-5	-3	-4	-5	-4	-3	-5	-4

32. (A) Quaalude → Quaere → Quebrachamine → Queen.

33. (C) abc dabdc adcb dcba

36. (C) 

5	15	60	300
↑	↑	↑	↑
$\times 3$	$\times 4$	$\times 5$	

37. (B) 

18	25	22	22
↑	↑	↑	↑
$+(8-1)$	$+(5-2)$	$+(2-2)$	

38. (D) 

ACE	DFH	HJL	MOQ
↑	↑	↑	↑
+3	+4	+5	

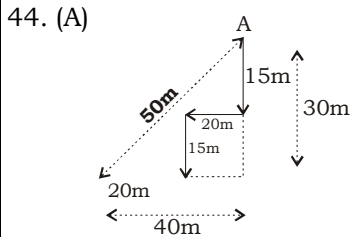
39. (B)  $A > C > B > D > E$

40. (A) As, WRITE → DIRGV

↑  
The place value same from behind  
Similarly, FRIEND → UIRVMW  
↑  
The place value same from behind

41. (C)  $4^2 \times 16 = 256$   
 $5^2 \times 30 = 750$   
 $7^2 \times 7 = 343$

42. (B)  $(4 \times 5)^2 = 400$   
 $(3 \times 6)^2 = 324$   
 $(13 \times 2)^2 = 676$
43. (D) HCF of 35 and 15 = 5  
HCF of 49 and 35 = 7  
HCF of 53 and 43 = 1



45. (D)

**I. True**

**II. False**

46. (A) As,
- Similarly,

51. (B) During sunrise and sunset the distance that the light has to travel from the sun to an observer is greatest. This means a large amount of blue and violet light has been scattered. So the light that is received by an observer is mostly of a longer wavelength and therefore appears to be red.
52. (B) The renowned Ayurveda physician 'Vaidya' Rajesh Kotecha has been appointed as new special secretary in Ministry of Ayush for three years on a contract basis. Kotecha is the chief consultant of Chakrapani Ayurveda Clinic, Jaipur.
53. (C) 52nd Constitutional Amendment Act, 1985 has banned floor crossing by the members elected on a party ticket to the legislation. It provides disqualification of members from Parliament and assembly in case of defection from one party to other.
54. (B) The symbol of the Indian Rupee was designed by the Bombay IIT postgraduate D.Uday Kumar. He has also designed a Tamil font named "Parashakti" as a mini project at the IDC, under the guidance of Prof. G. V. Sreekumar, who is one of the

few font experts in the country. During his MDes project he wrote and designed a book on Tamil typography, which is the first attempt at bringing such a subject to a Tamil audience. In this book D.Uday Kumar also created new Tamil terminology for many typographic terms where English words were used.

55. (D) The iconic Taj Mahal Palace hotel of Mumbai has acquired an 'image trademark' under the Trademark Act of 1999. Thus, the Palace has become the first building in India to get intellectual property rights protection for its architectural design. Now, it is will be difficult to use Taj Mahal Palace's images for commercial purposes without paying the company a licensing fee. The Trade Marks Act of 1999 is the current governing law relating to registered trademarks which replaced The Trade and Merchandise Marks Act of 1958.
57. (C) Human Chorionic gonadotropin is a hormone produced in the human placenta that maintains the corpus luteum during pregnancy.
59. (C) A basic microscope is made up of two converging lenses. The first lens creates a real image which serves as the object for the second lens, and the image created by the second lens is the one a viewer sees. The final image is magnified, virtual and inverted compared to the original object.
60. (D) The World Hydrography Day (WHD) is observed every year on June 21 to publicise the work of hydrographers and to create awareness about hydrography which is an essential science before undertaking any activity on or under the sea. The 2017 theme is "Mapping our seas, oceans and waterways – more important than ever".
61. (D) Napoleon -I and Field Marshal Arthur Wellesley never met or corresponded, and they fought only one battle directly against each other, one June 18, 1815. At Waterloo in Belgium, Napoleon Bonaparte suffered defeat at the hands of the Duke of Wellington. The fact that it was the Battle of Waterloo, which resulted in Napoleon's Permanent removal from the French throne, cemented them together in history.

62. (B) According to biological classification, first of all we see that the organism belongs to which kingdom and phylum, class, order, family, genus and then species.
63. (A) The Parliament enacted the "President Act, 1969" (Discharge of Functions) which provides that in the event of occurrence of vacancy in the office of both the President and the Vice-President, the Chief Justice of India or in his absence the senior-most judge of the Supreme Court available shall discharge the functions until a new President is elected.
64. (A) Pyrethrin used in mosquito coil is a natural, powdered material obtained from the seed of a kind of chrysanthemum plant.
67. (C) The liquidity preference theory of interest has been propounded by JM Keynes. According to him, "Interest is the reward for parting with liquidity."
68. (C) The world's first-ever data embassy will be established by the Estonian government in Luxembourg in 2018. For this, Prime Minister of Estonia Juri Ratas and Prime Minister of Luxembourg Xavier Bettel has signed an agreement on housing data and information systems, that will pave the way to open data embassy in Luxembourg. Its establishment is part of the Estonian general strategy of data management and fundamentally a double guarantee to their data and services. In addition, the data embassy will have the same rights as any other physical embassy of Estonia.
69. (C) The Bardoli Satyagraha of 1928, in the state of Gujarat, India during the period of the British Raj, was a major episode of civil disobedience and revolt in the Indian Independence Movement. Sardar Vallabh Bhai Patel played an important role and was the leader in Bardoli Satyagraha.
70. (A) The Bhawal National Park is located at Gazipur in Dhaka Division of Bangladesh. The core area of the park covers 940 hectares but extends to 5,022 hac of surrounding forest. Its purpose is to protect important habitats as well as to provide opportunities for recreation. The park has 345 plant species, including 152 different tree species, 53 shrubs, 106 herbs and 34 climber species.
72. (B) The rate of heart beat of an Elephant is about 25times/minute. This is because bigger animals don't need to pump as much blood as a bird. A birds' heart beats about 100 times a minute. And a human's heart beats about 72 times a minute.
74. (C) Since 1947, the Indian economy has been premised on the concept of planning. This has been carried through the Five-Year Plans, developed, executed, and monitored by the Planning Commission (NITI Aayog after 2014). With the Prime Minister as the ex-officio Chairman, the commission has a nominated Deputy Chairman, who holds the rank of a Cabinet Minister. Revised versions of the formula have been used since then to determine the allocation of central assistance for state plans. The new government led by Narendra Modi, elected in 2014, and has announced the dissolution of the Planning Commission, and its replacement by a think tank called the NITI Aayog (an acronym for National Institution for Transforming India). National Development Council finally approves the draft of five year plan.
75. (D) The Sixth ruler of Mughal Empire Aurangzeb banned Music and Dancing. Abul Muzaffar Muhi-ud-Din Muhammad Aurangzeb (14 October 1618 – 20 February 1707) generally known as Aurangzeb Alamgir was the third son of Shah Jahan and Mumtaz Mahal. He was a devout Muslim and strictly adhered to Islam. Aurangzeb was not like his ancestors. He made Islamic law as foundation of his reign. He destroyed many Hindu temples and forced many non-Muslim to convert into Islam. Aurangzeb lives a simple and pious life. He never touched alcohol and disliked music. He banned music and dance in his kingdom.
- 77. (B) The Election Commission of India (ECI)** has collaborated with **Facebook** to launch first Nationwide "Voter Registration Reminder" on July 1, 2017 to encourage Indian citizens to register themselves on the electoral rolls. As part of this campaign, Facebook will run a voter registration reminder in multiple Indian languages to all the Facebook users in India from July 1 to 4, 2017.

78. (B) The concept of Directive principles of State policy was borrowed from the Irish Constitution. The makers of the Constitution of India were influenced by the Irish nationalist movement.
79. (C) The Innovation Theory of Profit was proposed by Joseph. According to Schumpeter, innovation refers to any new policy that an entrepreneur undertakes to reduce the overall cost of production or increase the demand for his products.
80. (D) The book titled 'The Emergency – Indian Democracy's Darkest Hour' has been authored by Surya Prakash, the chairman of Prasar Bharati. The purpose of the book is to honour all those who fought for the restoration of democracy in the country in the mid-1970s.
81. (A) The Gulf of Mannar Biosphere reserve is the first marine Biosphere Reserve established in India and is situated along the southern coast of Tamil Nadu. The Biosphere Reserve includes the Gulf, the adjoining coasts and also the small islands dotting the gulf. The reserve also includes a Marine National Park. Biosphere reserves are areas comprising terrestrial, marine and coastal ecosystems. Each reserve promotes solutions reconciling the conservation of biodiversity with its sustainable use.
82. (A) Drones are male honey bees. They develop from eggs that have not been fertilized, and they cannot sting, since the worker bee's stinger is a modified ovipositor. The drones' main function is to be ready to fertilize a receptive queen.
83. (D) Petrol floats on water and with the oxygen from the atmosphere it keeps burning. Water is heavier than petrol and will just have the effect of spreading the fire.
85. (C) Dr. Manoj Soni, the former Vice Chancellor of Dr. Babasaheb Ambedkar Open University, has recently taken the Oath of Office and Secrecy as Member of Union Public Service Commission (UPSC). The Oath was administered by the UPSC Chairman Prof. David R. Syiemlieh. Dr. Soni is the youngest Vice Chancellor since independence. The UPSC can have a limit of 10 members including its chairman and conducts national-level recruitment exams like IAS, IFS and IPS.
86. (B) The organic relationship between the ancient culture of the Indus Valley and Hinduism of today is proved by the worship of Stones, trees and animals.
87. (A) The Vikram Sarabhai Space centre (VSSC) is a major space research centre of the Indian Space Research organization (ISRO), focusing on rocket and space vehicles for India's satellite programme. It is located in Thiruvananthapuram, in the Indian state of Kerala.
88. (C) Cut motion is a veto power given to the members of the Lok Sabha to oppose a demand in the financial bill discussed by the government. This can turn into an effective tool to test the strength of the government. If a cut motion is adopted by the House and the government does not have the numbers, it is obliged to resign.
89. (B) Mushroom cultivation fits very well with sustainable farming and has several advantages: It uses agricultural waste products; helps in recycling of vast quantity of organic wastes into mushrooms, biofertilizer and biogas.
92. (A) Small Industries Development Organization (SIDO) is a subordinate office of the Department of SSI & Auxiliary and Rural Industry (ARI). It is an apex body and nodal agency for formulating, coordinating and monitoring the policies and programmes for promotion and development of small scale industries. Development Commissioner is the head of the SIDO.
93. (A) Narinder Nath Vohra, the Governor of Jammu and Kashmir (J&K), has been appointed as the new President of the India International Centre (IIC), which is one of the premier cultural institutions in the country. He succeeded by Soli Sorabjee. The India International Centre (IIC) is a well-known non-official organization located in New Delhi.
94. (C) The term satyagraha was coined and developed by Mahatma Gandhi (1869–1948). He deployed satyagraha in the Indian independence movement and also during his earlier struggles in South Africa for Indian rights. Satyagraha theory influenced Martin Luther King, Jr.'s and James Bevel's campaigns during the Civil Rights Movement in the United States (1954–1968), and many other social justice and similar movements.
97. (C) The edible part of the onion plant is the bulb. This bulb is underground during growth, while green stalks that emerge from the bulb reach above the ground to

gather sunlight and carbon dioxide. Several foods related to the onion, such as **chives, garlic and leeks**.

99. (A) Similar to a normal good, it is an item for which demand (consumption) increases as income increases. Unlike a normal good, its income elasticity of demand is always above one. Superior goods are always expensive, and often are relatively scarce or harder to come by. Superior goods are purchased in place of a lesser quality item, therefore making up a larger proportion of consumption as income increases. A superior good might be a luxury automobile, while a normal good would be an average automobile.
100. (D) Jawaharlal Nehru made this historic speech to the Indian constituent Assembly on the eve of independence around midnight on 15th August 1947. "Long years ago we made a tryst with destiny, and now the time comes when we shall redeem our pledge ....".
111. (D) Head lost due to friction is 6 m. Power transmitted is maximum when friction head is 1/3 of the supply head.  
∴ Supply head should be 18 m.

112.(A) Force ratio =  $\frac{\rho_m}{\rho_p} \times \frac{L_m^2}{L_p^2} \times \frac{V_m^2}{V_p^2}$ ;

$$\frac{F_m}{F_p} = 1 \times \left(\frac{1}{10}\right)^2 \times \left(\frac{5}{10}\right)^2 \text{ or } \frac{F_m}{F_p} = \frac{1}{100} \times \frac{1}{4}$$

or  $F_p = 50 \times 400 = 20000 \text{ N}$ .

- 118.(C)  $\dot{H} = U + PV$   
 $= 3.5 \times 10^6 + 0.3 \times 10^6 \times 1.5/3$   
 $= (3.5 + 0.15) \times 10^6 \text{ J} = 3.65 \text{ MJ}$   
 ∴ Enthalpy for 3 kg =  $3 \times 3.65 = 10.95 \text{ MJ}$ .

- 123.(B) COP of reversed Carnot cycle

$$= \frac{T_1}{T_2 - T_1} = \frac{1}{\frac{T_2}{T_1} - 1} = 4,$$

or,  $\left(\frac{T_2}{T_1} - 1\right) = 0.25, \frac{T_2}{T_1} = 1.25.$

- 130.(D)  $\eta_{\text{carnot}} = \frac{T_1 - T_2}{T_1} = 0.8$

$$\text{COP} = \frac{T_2}{T_1 - T_2}$$

$T_1 - T_2 = 0.8 T_1$ , or  $0.2 T_1 = T_2$   
 or,  $T_1 = 5T_2$

∴  $\text{COP} = \frac{T_2}{5T_2 - T_2} = \frac{1}{4} = 0.25.$

134.(A)  $\frac{Q}{D^3 N} = \text{Constant}$

$$\left(\frac{Q}{D^3 N}\right)_1 = \left(\frac{Q}{D^3 N}\right)_2$$

$$\left(\frac{1200}{1000}\right) = \left(\frac{Q_2}{1500}\right) \quad \{D_1 = D_2\}$$

$Q_2 = 120 \times 15$

$Q_2 = 1800 \text{ lpm}$

146.(D)  $y^2 = \frac{9}{16} x^2 - 36$

Dividing by 36 in both side

$$\frac{y^2}{36} = \frac{x^2}{64} - 1$$

$$\left(\frac{x}{8}\right)^2 - \left(\frac{y}{6}\right)^2 = 1$$

This is the equation of hyperbola.

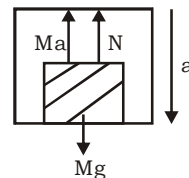
- 147.(C) Velocity = Acceleration × Time  
 or  $4 \text{ m/sec} = a \times 2$   
 and  $a = 2 \text{ m/sec}^2$

$$\begin{aligned} \text{Tension in cable} &= \frac{W}{g}(g + a) = \frac{1000}{9.81}(9.81 + 2) \\ &= \frac{11,810}{9.81} \cong 1200 \text{ kg}. \end{aligned}$$

- 148.(B)  $M_T = 14 \text{ gm}$

$M_A = 13 \text{ gm}$

weight of body appears less, means lift moving down with acceleration.



$$M_T a + N = M_T g \quad \{N = M_A \cdot g\}$$

$$a = g \frac{(M_T - M_A)}{M_T}$$

$$a = g \left(1 - \frac{M_A}{M_T}\right)$$

$$a = 10 \left(1 - \frac{13}{18}\right)$$

$a = 0.71 \text{ m/s}^2$

$a \cong 0.7 \text{ m/s}^2$

- 149.(B) For upward motion

$U = 980 \text{ cm/s}$

$= 9.8 \text{ m/s}$

and  $v = 0$

So  $v = u - gt$

$$0 = 9.8 - g.t$$

$$t = 1 \text{ sec}$$

$$\text{and } v^2 = u^2 - 2gh$$

$$0 = (9.80)^2 - 2 \times 9.8 \times h$$

$$h = 4.9\text{m}$$

For downward motion-

$$u = 0$$

$$h = 4.9\text{m}$$

$$a = g$$

$$\text{So } h = ut + \frac{1}{2}g.t^2$$

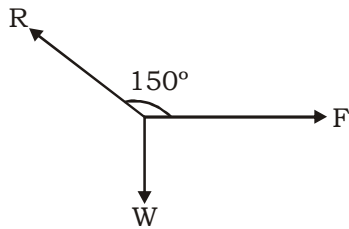
$$4.9 = 0 + \frac{g}{2}.t^2$$

$$t = 1 \text{ sec}$$

$$\text{So Total time} = 1 + 1 = 2\text{sec}$$

150.(C)  $R \cos 60^\circ = W$ , or  $R = \frac{W}{1/2} = 2W$

Also,  $R \cos 30^\circ = F$ , and  $F = 2W \times \frac{\sqrt{3}}{2} = \sqrt{3}W$ .



156.(C) Given data-

$$\sigma_a = 500 \text{ kg cm}^{-2}$$

$$\rho = 25 \text{ kg cm}^{-2}$$

$$\text{and } D = 2\text{m} = 200 \text{ cm}$$

$$\sigma_a = \sigma_c = \frac{P.D}{4t}$$

$$500 = \frac{25 \times 200}{4.t}$$

$$t = \frac{5000}{4 \times 500}$$

$$t = 2.5 \text{ cm}$$

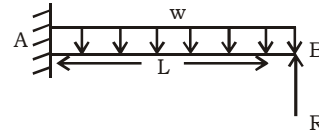
158.(B)  $WL = M$  ... (i)

$$\text{and } \frac{w.L^2}{2} = \frac{(wL)L}{2}$$

$$= \frac{WL}{2}$$

$$= \frac{M}{2}$$

160.(D)



$$(\delta_B)_{UDL} = (\delta_B)_R$$

$$\frac{w.L^4}{8EI} = \frac{R.L^3}{3EI}$$

$$R = \frac{3wL}{8}$$

161.(B)  $E = 2G(1 + \mu)$

$$200 = 2 \times 80(1 + \mu)$$

$$\mu = 0.25$$

$$\text{and } E = 3K(1 - 2\mu)$$

$$200 = 3K(1 - 0.5)$$

$$K = 133.33\text{GN/m}^2$$

162.(A)  $UTS = \frac{\text{Maximum load}}{\text{Initial area}}$

$$= \frac{5T}{1\text{cm}^2}$$

$$UTS = 5T/\text{cm}^2$$

178.(B) Kinematic chain is one which satisfies

$$L = \frac{2}{3}(J + 2),$$

which is not satisfied in this case.

181.(D)  $\frac{T_1}{T_2} = 5 = e^{-\mu\theta}$

$$\ln 5 = -\mu\theta$$

$$-\mu\theta = 1.6$$

$$\text{Now, } \mu' = 0.5\mu$$

$$-\mu'\theta = -0.5\mu\theta$$

$$= -0.5 \times (-1.6)$$

$$-\mu'\theta = 0.8$$

$$\text{So } \left(\frac{T_1}{T_2}\right)_f = e^{-\mu'\theta}$$

$$= e^{0.8}$$

$$= 2.225$$

189.(C)  $\eta_t = \left(1 - \frac{d}{P}\right)$

$$0.6 = 1 - \frac{d}{P}$$

$$\frac{d}{P} = 0.4$$