



KD Campus Pvt. Ltd

2007, OUTRAM LINES, 1ST FLOOR, OPPOSITE MUKHERJEE NAGAR POLICE STATION, DELHI-110009

Answer-key & Solution

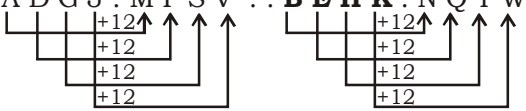
SSC JE (Mechanical)
MOCK -(107)
Date 17.7.2017

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


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. 107

1. (A) Light removes Darkness. Similarly, Knowledge removes Ignorance.
2. (B) Scissors are used to cut cloth. Similarly, Razor is used to shave beard.
3. (C) Feathers help a bird to fly. Similarly scales help a fish to swim.
4. (B) Elasticity is the property of spring. Similarly warmth is the property of wool.
5. (C) A D G J : M P S V :: **B E H K** : N Q T W

6. (D)

UP	SET	SET	UP
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 Similarly,

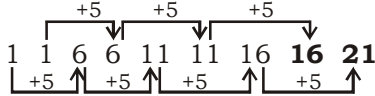
TIP	TOP	TOP	TIP
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7. (C) $9 \times 3 - 1 = 27 - 1 = 26$
 Similarly,
 $81 \times 3 - 1 = 243 - 1 = 242$
8. (A) $4 \times 5 = 20$, $5 \times 6 = 30$, **$7 \times 8 = 56$** , $8 \times 9 = 72$
9. (A) $7^3 - 6^2 = 343 - 36 = 307$
 $5^3 - 4^2 = 125 - 16 = 109$
10. (C) Radiation is different from the other three. All other words show convergence.
11. (C) Except the Pair of words Head-Cap, all other two words are antonyms to each other.
12. (A) $17 \times 2 + 2 = 34 + 6 = 40 \rightarrow 36$
 $21 \times 2 + 6 = 42 + 6 = 48$
 $25 \times 2 + 6 = 50 + 6 = 56$
 $31 \times 2 + 6 = 62 + 6 = 68$
13. (B) All except cone are 2D figures.
14. (A) Except 206 all other numbers are perfect cubes.
 $125 = 5 \times 5 \times 5$
 $27 = 3 \times 3 \times 3$
 $8 = 2 \times 2 \times 2$
15. (D)

$625 = 25 \times 25$	}	Odd number
$225 = 15 \times 15$		
$169 = 13 \times 13$		
$256 = 16 \times 16$		

 Even number
16. (D) $s \xrightarrow{-1} r \xrightarrow{-1} Q \xrightarrow{-1} P$
 $n \xrightarrow{-1} m \xrightarrow{-1} L \xrightarrow{-1} K$
 $g \xrightarrow{-1} f \xrightarrow{-1} E \xrightarrow{-1} D$
 $t \xrightarrow{-1} s \xrightarrow{-2} U \xrightarrow{+1} V$
17. (B) All except 289 is divisible by 13.
18. (A) $66 - 56 = 10$
 $101 - 90 = 11$
 $41 - 30 = 11$
 $33 - 22 = 11$
19. (A) $10.5 + 4.5 = 15.0$
 $15.0 + 6.5 = 21.5$
 Similarly,
 $32.5 + 4.5 = 37.0$

- $37.0 + 6.5 = 43.5$
20. (B)

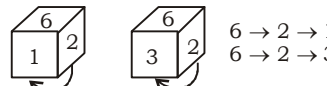
Daily	Weekly	Fortnightly	Monthly
2	1	4	3
Bimonthly			
5			
 21. (D) In the first step, the two smaller designs interchange positions while in the next step the entire figure rotates through 45° clock-wise.
 22. (C) In the subsequent figures the arrow moves from left to right and vice-versa, the circle moves one step in anticlockwise direction and the cross sign moves to the top and changes into a plus sign.

 23. (B)

1	6	11	16	21
+5	+5	+5	+5	
 24. (B) $(2)^2 = 4$
 $(2 + 4)^2 = (6)^2 = 36$
 $(6 + 6)^2 = (12)^2 = 144$
 $(12 + 8)^2 = (20)^2 = 400$
 $(20 + 10)^2 = (30)^2 = 900$
 $(30 + 12)^2 = (42)^2 = 1764$
 25. (B)

2	10	30	68	130
+8	+20	+38	+62	
+12	+18	+24		
+6	+6			
 26. (B) $4 \xrightarrow{+4} 8 \xrightarrow{+5} 13 \xrightarrow{+6} 19 \xrightarrow{+7} 26$
 $E \xrightarrow{+4} I \xrightarrow{+5} N \xrightarrow{+6} T \xrightarrow{+7} A$
 27. (B)

34.25	36.75	39.75	43.25	47.25	51.75	56.75
+2.50	+3.0	+3.5	+4.0	+4.5	+5.0	
 28. (C) MASTER
 29. (D) There is only one 'E' in the given word, therefore the word RELATE cannot be formed.
 30. (D)

D	E	A	B	C
↑	↑	↑	↑	↑

 School B is on the left of school C.
 31. (B) Only son of Fatima's grandfather means Fatima's father. Therefore, Fatima is the sister of Mustafa.
 32. (*) Read the 2nd figure as given below.
 From the two views of cube, it is clear that '3' lies opposite to 1.

 33. (C) $27 = 3 \times 3 \times 3$
 Two years ago
 $27 - 2 = 25 = 5 \times 5$
 Next perfect cube

$64 = 4 \times 4 \times 4$

$\therefore 64 - 27 = 37 \text{ years}$

34. (D) Number of persons do not play any Games
 $= [60 - (9 + 8 + 10 + 7 + 11 + 12)]$
 $= 60 - 57 = 3$

35. (B) First Column

$\frac{7 \times 4}{2} = 14$

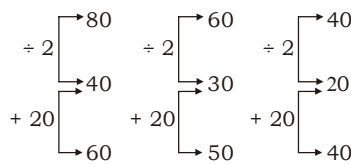
Second Column

$\frac{9 \times 8}{3} = \mathbf{24}$

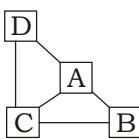
Third Column

$\frac{10 \times 6}{4} = 15$

36. (B)



37. (B)



38. (C) G I V E and B A T
 $\downarrow \downarrow \downarrow \downarrow \quad \downarrow \downarrow \downarrow$
 $5 \ 1 \ 3 \ 7 \quad 9 \ 2 \ 4$

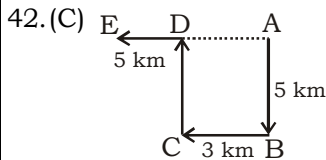
Therefore,

G A T E
 $\downarrow \downarrow \downarrow \downarrow$
 $5 \ 2 \ 4 \ 7$

39. (B) $8^2 - 5^2 + 3^2 = 48$
 $3^2 - 7^2 + 6^2 = -4$ (Ignore the '-' sign)
 $4^2 - 7^2 + 6^2 = \mathbf{3}$

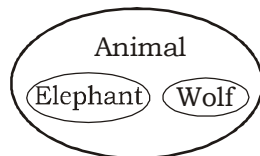
40. (D) $P = Q$
 $S > R > T > P = Q$
 S is the eldest.

41. (A) $8 \times 5 = 27 - 3 + 16$
 $\Rightarrow 40 = 43 - 3$
 $\Rightarrow 40 = 40$



$AE = AD + DE = (3 + 5) \text{ km} = 8 \text{ km}$

43. (A) Elephant is different from Wolf. But both are animals.

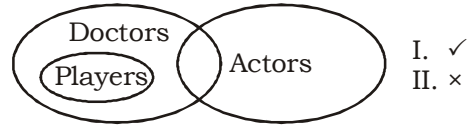


44. (A) From both the statements it is clear that people who live in the big city face problems in travelling. Therefore, only

conclusion I follows. Nothing has been stated about traffic jam.

45. (C) $2^3 - 2^2 - 1^2 = 8 - 4 - 1 = 3$
 $3^3 - 3^2 - 2^2 = 27 - 9 - 4 = 14$
 $4^3 - 4^2 - 3^2 = 64 - 16 - 9 = 39$
 $5^3 - 5^2 - 4^2 = 125 - 25 - 16 = \mathbf{84}$
 $6^3 - 6^2 - 5^2 = 216 - 36 - 25 = 155$

46. (A)



51. (A) The Ajivikas belonged to an ancient Indian sect who believed in Karma, fatalism and extreme passivity. They were a popular sect during the reign of Bindusara, the Mauryan Emperor. In the edicts of Ashoka this sect is mentioned. From Buddhist and Jain texts we come to know about Ajivikas. The Barabar caves belonging to the Ajivikas sect are located in the state of Bihar. Makkhali Gosala is considered the founder of Ajivika sect.

52. (A) Kanishka was the emperor of Kushan dynasty. The main capital of his empire was located at Purusapura in Gandhara (Peshawar), with two other capitals at ancient Kapisa (present Bagram Afghanistan) and Mathura, India. His conquests and patronage of Buddhism played an important role in the development of Silk Road and transmission of Mahayana Buddhism from Gandhara access the Karakoram range to China.

* Silk Road is also known as silk route, an ancient trade route that links China with the West. This route carried goods and ideas between Rome and China.

53. (A) Battle of Wandiwash (22 Jan, 1760) war between the French under the Comte de Lally and the British under Sir Eyre Coote. It was the decisive battle in the Anglo-French struggle in Southern India during the seven years of war (1756-63). The British East India Company defeated the French forces at Wandiwash Battle ending almost a century over supremacy in India. This Battle gave the British trading company a far superior position in India compared to other Europeans.

55. (C) Islam was founded in 622 CE (Common Era) by the Muhammad Prophet. He lived from 8 June 570 to 632 CE. Islam religion started in Mecca. Muhammad reported revelations that he believed to be from God conveyed to him through the

- archangel Gabriel (Jibril). The contents of these revelations are known as Quran.
- 56.(A) According to a tradition, the word Lavani is derived from the word Lavanya which means beauty. Lavani is a genre of music popular in Maharashtra . It is a combination of traditional song and dance, which is performed on the beats of Dholki, a percussion instrument. Lavani is noted for its powerful rhythm. It also contributed to the development of Marathi folk theatre. In Maharashtra and Southern Madhya Pradesh it is performed by the female performers wearing 9-yard long saris.
- 57.(A) Battle of Buxar, was a decisive battle fought between British and Indian forces at Buxar, a town on the Ganges River. Mir Kasim the Nawab (Governor) of Bengal, wanted to free his territory of British control. He formed an alliance with the Nawab of Oudh and Shah Alam II, the Mughal emperor. The combined Indian armies invaded Bengal and clashed with British troops, led by Major Hector Munro, in October 1764. This Battle resulted in the victory of the British. As a result, in 1765, Robert Clive signed Treaty of Allahabad with the Nawab of of Oudh and Shah Alam II. The treaty effectively legalized the British East India Company's control over the whole of Bengal.
58. (B) Article 62 of the Indian Constitution deals with the time of holding election to fill vacancy in the office of President and the term of office of person elected to fill casual vacancy.
- (i) An election to fill a valancy caused by the expiration of the term of office of President shall be completed before the expiration of the term.
- (ii) An election to fill a vacancy in the office of President occurring by reason of his death, resignation or removal or otherwise shall be held as soon as possible after and in no case later than six months from, the date of occurrence of the vacancy and the person elected to fill the vacancy shall be subject to the provisions of Article 56, entitled to hold office for the full term of five years from the date on which he enters upon the office.
59. (A) The Rule of Law is an aspect of the British Constitution that has been given by AV Dicey and can be considered an important part of British Politics. It says that -
- (i) The rights of individuals are determined by legal rules and not by the arbitrary behaviour of authorities.
- (ii) There can be no punishment unless a court decides that there has been a breach of law. Everyone, regardless of your position in society, is subject to the law.
- 60.(B) The part of the earth and its atmosphere in which living organisms exist or that is capable of supporting life is known as Biosphere.
- Biomass is a biological material derived from living organisms.
- Lithosphere is the outer part of the earth, consisting of the crust and upper mantle, about 100 kilometres (62 miles) thick.
- Hydrosphere is the water surrounding the surface of the globe, including water of the oceans and the water in the atmosphere.
- 61.(B) Umbra is a region of complete shadow resulting from the total obstruction of light by an opaque object, mainly the shadow cast by the moon on to the earth during solar eclipse. It is also known as the darker inner region of a sunspot. People living in this region will experience total eclipse.
- Penumbra is a shaded region surrounding the dark central portion of a sunspot. In an eclipse a space of partial illumination between the perfect shadow on all sides and the full light is the Penumbra. People of this area will experience partial eclipse.
- Antumbra is the region from which the occluding body appears entirely contained within the disc of the light source. Observer will experience annular eclipse, in which a bright ring is visible around the eclipsing body.
- 62.(D) Extrusive rocks are derived from Magma (molten silicate material) that was poured out or ejected at the Earth's surface. Both lava flow and pyroclastic debris (fragmented volcanic material) are extrusive. They are commonly glassy (obsidian), andesite, gabbro and Perodite.
64. (B) The Sunderbans is a natural region in Bengal comprising Bangladesh and Eastern India. It is the largest forest in the world. It covers 10,000 kms of which 60% is in Bangladesh and remaining in India. Mangroves are survivors. Their roots are submerged in water. These trees thrive in hot, muddy, salty

- conditions. Their roots hold the mangrove upright in the shifting sediments where land and water meet.
- 66.(D) Fourth five year plan (1969-1974) - In this plan, Government Nationalised 14 banks and the green revolution in India to advance agriculture. The target growth rate was 5.6%, but the actual growth rate was 3.3%.
- 67.(C) Dr. Manmohan Singh, the then Union Finance Minister, in his Budget speech for the year 1994-95 introduced the new concept of service Tax. It was given the constitutional status by chapter VA of the finance Act 2003.
- 71.(D) Schumpeter developed the innovation theory of profit. Innovation was divided by him into five types -
- Launch a new product or a new species of already known product.
 - Application of new methods of production or sales of a product.
 - Opening of a new market.
 - Acquiring of new sources of supply of raw material or semi-finished goods.
 - New industry structure such as the creation or destruction or semi-finished goods.
- 72.(B) Economic theory is a broad concept or statement or proposition for the explanation and understanding the movement of goods in a market. Basically, it is an idea and principles that aim to describe how economies work.
- 73.(D) Endoscopy is a technique with the help of which we can look inside the body for medical reasons. Optic fibres are used in endoscopy.
- 80.(C) Lord Canning (1856-58) was the last Governor General and from 1858-62 he was the first Viceroy of India.
- ⇒ Mutiny took place in his time.
 - ⇒ On November, 1858, the rule passed on to the crown.
 - ⇒ Withdrew Doctrine of Lapse.
 - ⇒ The Universities of Calcutta, Bombay and Madras were established in 1857.
 - ⇒ Indian Council Act was passed in 1861.
- 81.(C) The kingdoms of Golconda and Ahmednagar did not contend for the Tungabhadra Doab.
- 82.(C) Biodiesel is an alternative fuel for diesel engine that is produced by chemically reacting a vegetable oil or animal fat with an alcohol such as methanol or ethanol. Oil + alcohol → biodiesel + glycerin
- The chemical reaction that converts a vegetable oil or animal fat to biodiesel is called transesterification .
- 88.(A) The Supreme Court of India is the highest judicial forum and final court of appeal under the Constitution of India. It comprises the chief Justice of India and 30 other Judges.
- 89.(D) The retina contains two types of photoreceptors, rods and cones. Rods cells are more sensitive than cones. The rod system has very low spatial resolution but is extremely sensitive to light. The cone system has very high spatial resolution but is relatively insensitive to light. The properties of the cone system also allow us to see colour.
- 91.(A) Robert Koch in 1883 discovered Cholera germs. The bacterium named *Vibrio cholerae* is the microorganism that causes cholera.
- 96.(B) Delegation means assigning work to the others and giving them authority to do so. It involves-
- Assignment of duties to subordinate.
 - Granting of authority to enable the subordinate to perform the duties assigned.
 - Creation of obligation on the part of subordinate to perform duties in an orderly manner.
- Local governments are required to make numerous decisions everyday in order to discharge their powers and responsibilities. So, to reduce the amount of meeting time, local governments delegate many decisions to respond more effectively to the community and provide timely consistent decisions to be made.
- 99.(B) The right to freedom of expression and the right to peaceful protest are crucial in a democracy. Information and ideas help to inform political debate and are essential to public accountability and transparency in Government. The right to free speech and protest, along with the right to form and join associations or groups are found in Articles 10 and 11 of the Human Rights Act.
- These rights can be limited by law to protect the interests of others, but only when the limitation is proportionate and necessary in a democratic society.
- 100.(B) A Presidential System is a system of government where an executive branch is led by a president who serves as both head of the state and head of the

government. In such a system, this branch exists separately from the legislature, to which it is not responsible and which it cannot, in normal circumstances.

As compared to Parliamentary Systems, the Presidential System suffers less from the danger of oppression of minorities since votes are led by issues that concern the majority. The Presidential System is better from the point of view of accountability since executive can be directly voted down and so, stability of the Government is assured in this system.

103.(C) Power \propto torque

$$\frac{P_A}{P_B} = \frac{T_A}{T_B}$$

$$T = J \cdot \frac{\tau}{r}$$

$$J = \frac{\pi}{32} D^4$$

So $T = \frac{\pi}{16} D^3$ or $T \propto D^3$

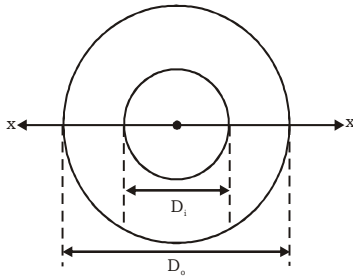
So $\frac{P_A}{P_B} = \left(\frac{D_A}{D_B}\right)^3$

$$\frac{P_A}{P_B} = \left(\frac{1}{2}\right)^3 = \frac{1}{8}$$

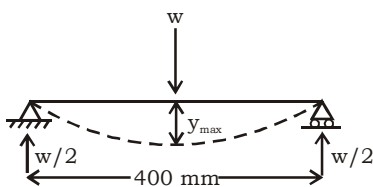
108.(A) $I_{xx} = \frac{\pi}{64} (D_o^4 - D_i^4)$

$$= \frac{\pi}{64} [8^4 - 6^4]$$

$$I_{xxx} = 137.44 \text{ cm}^4$$



109.(C)



$$\sigma_{\max} = \frac{480}{\pi} \text{ MPa}$$

$$M_{\max} = \frac{wL}{4} = 100 \text{ wNm}$$

$$M_{\max} = \frac{\pi}{32} (20)^3 \frac{480}{\pi}$$

$$w = 1.12 \text{ KN}$$

Deflection $y_{\max} = \frac{wL^3}{48EI}$

$$y_{\max} = \frac{dU}{dW}$$

$$\int dU = \int y_{\max} dw$$

$$U = \int \frac{wL^3}{48EI} dw$$

$$U = \frac{w^2 L^3}{96EI}$$

Putting the values

$$U = 581.46 \text{ N mm}$$

So $U \approx 611 \text{ N mm}$

111.(B)

$$(\sigma)_{\text{gradually load}} = F / A$$

$$(\sigma)_{\text{impact load}} = 2F / A$$

$$\frac{(\sigma)_{\text{impact load}}}{(\sigma)_{\text{gradual load}}} = 2$$

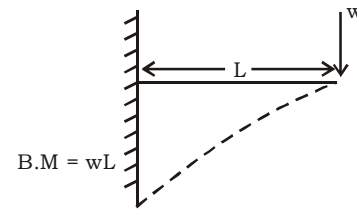
112.(A) $\frac{dM}{dx} = V$... (i)

If M is constant

$$\frac{dM}{dx} = 0$$
 ... (ii)

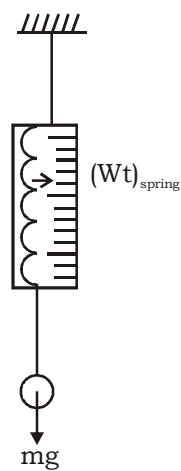
So $V = 0$

113.(C)

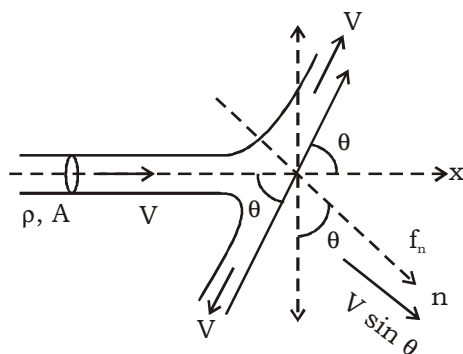


M_{\max} at fixed support so failure occur at fixed end.

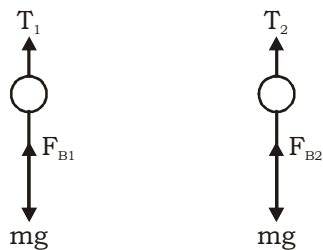
121.(A) Weight = 10g ... (i)
 (spring wt) = (original wt)
 $9.81g' = 10g$
 $g' = 10 \text{ m/s}^2$



178.(B) $F_n = \frac{d}{dt} [\text{final Momentum} - \text{Initial Momentum}]$
 $= m_i [V \sin \theta - 0]$
 $F_n = P \cdot AV^2 \sin \theta$



185.(D)



In air

In Water

$T_1 - mg - f_{B1} \dots (i)$

$T_2 = mg - f_{B2} \dots (ii)$

Equation (i) - equation (ii)

$(3 - 2.5)g = \rho_w \cdot v \cdot g - \rho_{air} \cdot v \cdot g$

$(0.5)g = (\rho_w - \rho_a) v g$

$v = \left(\frac{0.5}{1000 - 1.25} \right) = 5 \times 10^{-4} m^3$

from equation (i)

$T_1 = mg - F_{B1}$

$3g = \rho_b \cdot vg - \rho_a \cdot vg$

$3g = (\rho_b - \rho_a) vg$

$\rho_b = \left(\frac{3}{v} + \rho_a \right)$

$\rho_b = 600.25$

Specific gravity of Body, $S_b = \frac{P_b}{P_{water}} = 6.00125$

$S_b \simeq 6$

187.(B) $K = \frac{\Delta P}{(\Delta V / V)}$
 $= \frac{(150 - 50)}{(0.04 - 0.039)} N/cm^2$
 $= \frac{100}{0.04} \frac{N}{cm^2}$
 $= \left[\frac{100}{1 - \frac{0.039}{0.04}} \right] \frac{N}{cm^2}$

$K = 4000 \frac{N}{cm^2}$