



# KD Campus Pvt. Ltd

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

## Answer-key & Solution

SSC JE (Mechanical)  
MOCK -(142)  
Date:- 30.6.2018

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

1. (C) Sanitation keeps illness away and care keeps accident away.

2. (A) As, G r t k K t r G  
a b c d d c b a  
Similarly, F j b H **H b j F**  
a b c d d c b a

3. (B) As,  $\begin{matrix} 20 & & 11 \\ & \swarrow & \searrow \\ & +2+1 & \end{matrix}$

Similarly,  
 $\begin{matrix} 102 & & 52 \\ & \swarrow & \searrow \\ & +2+1 & \end{matrix}$

4. (D) Chemical formula is possible only for water (H<sub>2</sub>O).

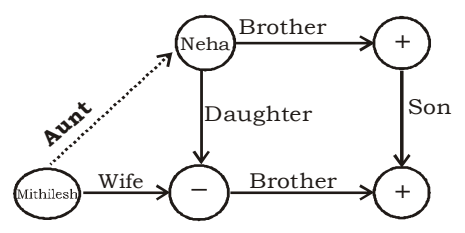
5. (B)  $\begin{matrix} E & C & B & Y & & G & E & D & A & & W & U & T & O \\ \uparrow & \downarrow & \uparrow & \downarrow & & \uparrow & \downarrow & \uparrow & \downarrow & & \uparrow & \downarrow & \uparrow & \downarrow \\ -2 & -1 & -3 & & & -2 & -1 & -3 & & & -2 & -1 & -3 \\ R & T & U & X \\ \uparrow & \downarrow & \uparrow & \downarrow \\ +3 & +1 & +3 & \end{matrix}$

6. (A)  $\begin{matrix} 52 & 61 & 43 & 54 & 72 & 83 & 18 & 29 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +9 & +11 & +11 & +11 & \end{matrix}$

7. (B) Franchise → Frantic → Fraternity → Fraudulent → Fraught

8. (A) H I J H / H I J H / H I J H / H I J H

9. (A)



10. (C)  $X > W > Y$  - (i)  
 $Z > Y$  - (ii)  
From (i) and (ii), we have , Y is the shortest among all.

11. (B)  $\begin{matrix} & -3 & & -3 & & -3 & & -3 \\ & \downarrow & & \downarrow & & \downarrow & & \downarrow \\ C A R & G C O & K E L & Q G I & S I F \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +4 & +4 & +4 & +4 & +4 & +4 & +4 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +2 & +2 & +2 & +2 & +2 & +2 & +2 \end{matrix}$

12. (A)  $\begin{matrix} 100 & 50 & 52 & 26 & 28 & 14 & 16 & 8 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +2 & +2 & +2 & +2 & +2 & +2 & +2 & +2 \end{matrix}$

13. (C) PAVEMENT

14. (A)  $\begin{matrix} S & Y & S & T & E & M \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ -1 & -1 & -1 & -1 & -1 & -1 \\ R & X & R & S & D & L \\ \\ C & O & R & R & E & C & T \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ B & N & Q & Q & D & B & S \end{matrix}$

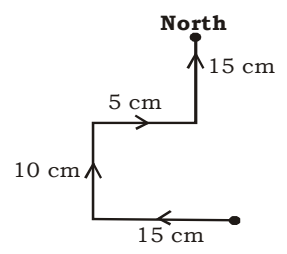
15. (B) 9 A 2 B 6 D 4 C 2

$9 + 2 \times 6 - 4 \div 2$   
After putting the signs as per the given details,  
 $9 + 12 - 2 = 19$

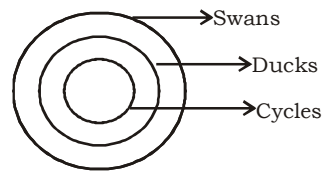
16. (B)  $4 \times 3 \Rightarrow 4 + 3 = 7 \Rightarrow 7 \times 2 = 14$   
 $5 \times 4 \Rightarrow 5 + 4 = 9 \Rightarrow 9 \times 2 = 18$   
 $6 \times 5 \Rightarrow 6 + 5 = 11 \Rightarrow 11 \times 2 = 22$   
 $7 \times 6 \Rightarrow 7 + 6 = 13 \Rightarrow 13 \times 2 = 26$

17. (B)  $12 = 8 + 4, 100 = 44 + 56$

18. (A)



19. (B)



I. ×

II. ✓

∴ Only conclusion II follows

26. (B) Actor plays in a play and musician plays in a concert.

27. (C)  $\begin{matrix} E & G & I & K & : & F & I & L & O \\ \uparrow & \uparrow & \uparrow & \uparrow & & \uparrow & \uparrow & \uparrow & \uparrow \\ +1 & +2 & +3 & +4 & & +3 & +4 & +4 & +4 \end{matrix}$

$\begin{matrix} F & H & J & L & : & G & J & M & P \\ \uparrow & \uparrow & \uparrow & \uparrow & & \uparrow & \uparrow & \uparrow & \uparrow \\ +1 & +2 & +3 & +4 & & +3 & +4 & +4 & +4 \end{matrix}$

28. (B)  $583 : 295 :: 486 : 378$   
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$   
 $5+8+3 \quad 2+9+5 \quad 4+8+6 \quad 3+7+8$   
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$   
 $16 \quad 16 \quad 18 \quad 18$

29. (A) Clearly, the answer is option (i). In all other pairs, the second one is the place to stay for the first one.

$\begin{matrix} W & V & U & N & M & L & H & G & F \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \end{matrix}$   
 $\begin{matrix} D & B & A \\ \uparrow & \uparrow & \uparrow \\ -2 & -1 & \end{matrix}$

30. (B)

31. (D)  $1629 \Rightarrow 1 + 6 + 2 = 9$   
 $3418 \Rightarrow 3 + 4 + 1 = 8$   
 $2349 \Rightarrow 2 + 3 + 4 = 9$

**1834**  $\Rightarrow 1 + 8 + 3 \neq 4$

32. (B) Exploit  $\rightarrow$  Explore  $\rightarrow$  Explosive  $\rightarrow$   
 Exponent  $\rightarrow$  Exposition

33. (C) SECULAR

34. (C)

Letter	A	X	R	A	Y	W	H	T
Position in opposite Alphabet Letters	26	3	9	26	2	4	19	7

$\Rightarrow$  XRAY =  $3 + 9 + 26 + 2 = 40$

$\Rightarrow$  WHAT =  $4 + 19 + 26 + 7 = 56$

35. (B) (10 C4) A (4 C4) B 6

After taking the signs as per the given instruction,

$(10 \times 4) + (4 \times 4) - 6$   
 $= 40 + 16 - 6$   
 $= 50$

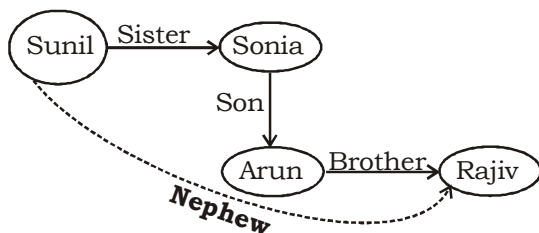
36. (D)  $324 \oplus 289 = \sqrt{324} = \sqrt{289} = 18 + 17 = 35$

$441 \oplus 484 = \sqrt{441} + \sqrt{484} = 21 + 22 = 43$

$625 \oplus 400 = \sqrt{625} + \sqrt{400} = 25 + 20 = 45$

37. (B)
- |              |              |              |               |               |               |
|--------------|--------------|--------------|---------------|---------------|---------------|
| 63           | 72           | 81           | 90            | <b>99</b>     | 108           |
| $\downarrow$ | $\downarrow$ | $\downarrow$ | $\downarrow$  | $\downarrow$  | $\downarrow$  |
| $9 \times 7$ | $9 \times 8$ | $9 \times 9$ | $9 \times 10$ | $9 \times 11$ | $9 \times 12$ |
| $\uparrow$   | $\uparrow$   | $\uparrow$   | $\uparrow$    | $\uparrow$    | $\uparrow$    |
| +1           | +1           | +1           | +1            | +1            | +1            |

38. (A)



39. (C)
- |                   |        |       |
|-------------------|--------|-------|
|                   | M      | D     |
| Present age       | 5x     | x     |
| Age after 5 years | 5x + 5 | x + 5 |

ATQ,

$3(x + 5) = 5x + 5 \Rightarrow 3x + 15 = 5x + 5$   
 $\Rightarrow x = 5$

and  $5x = 25$

$\therefore$  Present age of mother = 25 yrs.

40. (A)
- 

41. (A)
- 

So, she is in the east from starting point.

42. (B) Only conclusion II follows.  
 43. (B) Total number of triangles = 18  
 44. (C)  $7 \times 8 = 56$   
 $9 \times 5 = 45$   
 $11 \times 9 = 99$

45. (D)
- 

50. (C) G A T E  
 22 96 34 78

51. (D) The **Midday Meal Scheme** is a school meal programme of the Government of India designed to improve the nutritional status of school-age children nationwide.

**Main Objective of Mid-Day Meal Scheme:**

- Boost Universalization of Elementary Education - increasing enrolment, attendance, retention and bring down the dropout rate.
- Improving the nutritional status of children.
- Encourage poor children to attend school regularly and help them to concentrate on classroom activities- stop classroom hunger.

52. (C) The **first meeting** of the Constituent Assembly of India took place in Constitution Hall, **New Delhi**, on **9<sup>th</sup> December 1946**. **Dr. Sachchidananda Sinha** was the first chairman (**temporary**) of Constituent Assembly. Later **Dr. Rajendra Prasad** was elected as the president and its vice-president was **Harendra Coomar Mookerjee**.

53. (C) The **Komagata Maru** was a **coal-transport steamship** that had been converted into a passenger ship by Hong Kong-based businessman **Gurdit Singh**. It set off from Hong Kong in **April 1914**, reaching Vancouver's harbour a month later with **376 people** on board.
55. (D) The **Niger Delta** is the delta of the **Niger River** sitting directly on the **Gulf of Guinea** on the Atlantic Ocean in Nigeria. Niger Delta is a very densely populated region sometimes called the **Oil Rivers** because it was once a major producer of **palm oil**.
57. (D) A **bluish-green** crystalline compound that is used in sewage and water treatment, and as a pigment and fertilizer. It is also used in medicine to treat iron deficiency. It is also called **Green Vitriol**. (Chemical formula: **FeSO**)
59. (D) **Roland Georges Garros** (1888–1918), was a **French aviator** and **World War I fighter pilot**. **French Open**, a major (grand slam) tennis tournament is also known as Roland Garros, named after him.
60. (C) **Kumbh Mela**, inscribed on the **UNESCO's** Representative List of Intangible Cultural Heritage of Humanity, is a mass Hindu pilgrimage of faith in which Hindus gather to bathe in a sacred or holy river. Traditionally, four fairs are widely recognized as the Kumbh Melas: the **Haridwar Kumbh Mela**, the **Allahabad Kumbh Mela**, the **Nashik- Trimbakeshwar Simhastha**, and **Ujjain Simhastha**. These four fairs are held periodically at one of the following places by rotation: Haridwar, Allahabad (Prayaga), Nashik district (Nashik and Trimbak), and Ujjain.
61. (C) The **Bhimbetka rock shelters** are an archaeological site in central India that spans the prehistoric Paleolithic and Mesolithic periods, as well as the historic period. They are situated some 28 miles (45 km) south of **Bhopal**, in west-central **Madhya Pradesh** state.
62. (A) The **Lahore Resolution**, commonly known as the **Pakistan Resolution**, was a formal political statement adopted by the Muslim League at the occasion of its three-day general session on 22–24 March 1940 that called for greater Muslim autonomy in British India. The resolution was presented at Minto Park, in Lahore, by **Maulvi A.K. Fazlul Huq** on the instructions of the Working Committee.
63. (D) The **Central Statistics Office** (CSO) is a governmental agency in India under the Ministry of Statistics and Programme Implementation responsible for co-ordination of statistical activities in India, and evolving and maintaining statistical standards.
64. (C) Beyond the gas giant Neptune lies a region of space filled with icy bodies. Known as the **Kuiper Belt**, this chilly expanse holds trillions of objects, remnants of the early solar system.
66. (C) **Ultrasound** uses sound waves to create an image (picture). The sound waves can't be heard and the power of the sound waves used is very low. In pregnancy an ultrasound scan can be used **to look at the developing baby**.
68. (D) The **Pushkar Fair** is one of the most attractive festivals in **Rajasthan**. In the start of winters every year, the desert landscape is seen covered by almost **30,000 camels**. The fair eponymous with camels is a fascinating colorful opportunity to witness an Indian festival.
69. (B) An Inquiry into the Nature and Causes of the **Wealth of Nations** is the full name of the famous book by **Scottish economist** and **moral philosopher Adam Smith**. Known more commonly by its shortened name, The Wealth of Nations was **published in 1776**.
70. (A) **Data Protection Day** marks a global event that occurs every **28<sup>th</sup> January** to raise awareness and promote privacy and data protection best practices. It is an effort to empower people to protect their privacy, control their digital footprint and escalate the protection of privacy and data as everyone's priority.
- 7<sup>th</sup> February : **Safer Internet Day**
  - 1<sup>st</sup> March : **Zero Discrimination Day**
  - 4<sup>th</sup> March : **National Security Day**
72. (D) The **planets, asteroids, and comets** travel around the **Sun**, the center of our **Solar System**. The Solar System is elliptical or egg shape, and is part of a galaxy known as the **Milky Way**. The inner Solar System consists of the Sun, Mercury, Venus, Earth and Mars.
- **Nebula**: A nebula is a massive cloud of gas and dust in outer space.

75. (C) **Neelam Kapur**, the 1982 batch **Indian Information Service (IIS)** officer appointed as the new **Sports Authority of India (SAI)** director general (DG), was serving as the Principal Director General of the **Directorate of Field Publicity (DFP)**.
76. (A) Hard currency is currency that has been adopted as an acceptable payment method in multiple countries. Hard currencies are generally issued by developed countries that have a strong industrial economy accompanied by a stable government. The most common hard currencies include the U.K. pound sterling (GBP), the euro (EUR) and U.S. dollar (USD).
77. (A) The Union List is the longest of the three lists. It lists 97 subjects on which the Union Parliament can pass laws. The effective strength of the Union List is now 98. The main subjects of the Union List are: Defence, Foreign Affairs, War and Peace, Atomic Energy, Railways, Post and Telegraph, Citizenship, Banking, Insurance, National Highways, Census, Election, Institutions of higher education and others.
78. (B) Power sharing is the very spirit of democracy. Power can also be shared among different groups which differ socially like different religious and linguistic groups. 'Community Government' in Belgium is a good example of this type of power sharing. The system of reserved constituencies in India is another example.
79. (A) Public interest litigation is litigation for the protection of the public interest. The term PIL originated in the United States in the mid-1980s.
80. (D) Vijay Stambha (Tower of Victory) is a huge nine storey tower which was built by Maharana Kumbha to commemorate his victory over the Muslim rulers of Malwa and Gujarat in 1440 A.D. The tower is 122 ft. (37 m) high and stands on a 10 ft. (3.0 m) high base.
81. (C) Jerome Hayden Powell has been sworn-in as the new Chairman of the Federal Reserve for a four-year term on February 5, 2018.
82. (A) Deccan Traps is a very large igneous province located in west central India. It consists of more than 6,500 feet of flat-lying basalt lava flows and covers an area of nearly 200,000 square miles in west-central India.
83. (D) The Mettur Dam is one of the largest dams in India built in 1934. It was constructed in a gorge, where the Kaveri River enters the plains in Tamil Nadu. The dam is one of the oldest in India. It provides irrigation facilities to parts of Salem, the length of Erode, Namakkal, Karur, Tiruchirapalli and Thanjavur district for 271,000 acres of farm land. The total length of the dam is 1,700 m. The dam creates Stanley Reservoir.
84. (B) Ravi Shankar, colloquially known as Sri Sri Ravi Shankar is a spiritual leader and founder of the Art of Living Foundation (founded 1982), which aims to relieve individual stress, societal problems and violence global values.
85. (B) The separation of powers, often imprecisely used interchangeably with the tries political principle, is a model for the governance of a state. The normal division of branches is into a legislature, an executive, and a judiciary. Division of powers is the often overlooked principle of dividing governmental power among the federal, state, and local governments.
87. (D) According to the Constitution of India, the role of the Supreme Court is that of a federal court and guardian of the Constitution. The Federal Court of India was a judicial body, established in India in 1937 under the provisions of the Government of India Act 1935, with original, appellate and advisory jurisdiction. It functioned until 1950, when the Supreme Court of India was established.
89. (B) The pressure exerted by a static fluid depends only upon the depth of the fluid, the density of the fluid and the acceleration of gravity. The pressure in a static fluid arises from the weight of the fluid and is given by the expression static fluid =  $dgh$ , where  $d$  = fluid density,  $g$  = acceleration due to gravity and  $h$  = depth of fluid. Static fluid pressure does not depend on the shape, total mass or surface area of the liquid.



90. (D) Most Tsunami are caused by earth quakes generated in a seduction zone, an area where an oceanic plate is being forced down into the mantle by plate tectonic forces. The friction between the sub-ducting plate and the overriding plate is enormous.

92. (C) The different parts of a flower are calyx, corolla, androecium and gynoecium. Calyx and corolla are accessory organs, while androecium and gynoecium are reproductive organs. Photosynthetic activity is found in the calyx, green shoulder, pericarp and locular parenchyma. It suggests that all of these tissues have significant roles in CO<sub>2</sub> scavenging and the provision of carbon assimilates.

95. (C) It was on 4<sup>th</sup> December 1829, when the practice was formally banned in all the lands under Bengal Presidency by Lord William Bentinck. By this regulation, the people who abetted sati were declared guilty of "culpable homicide".

97. (C) • Saliva: It is secreted by the salivary glands, Sweat achieved by the water-rich secretion of the eccrine glands.

- Epinephrine: Also known as adrenaline is a hormone and a neurotransmitter.
- Bile: It is a bitter-tasting dark green to yellowish brown fluid produced by the liver that aids the process of digestion of lipids in the small intestine.
- Bile is the odd one among all four as it is secreted by liver, while others are secreted by glands.

98. (B) Snakes have the maximum number of ribs. On an average they have 200 to 400 bones (Vertebrae) and each has a pair of ribs on either side.

100.(C) On February 8, 2018, Central Government announced that it has approved the construction of over 1.86 lakh more houses for urban poor under the Pradhan Mantri Awas Yojana (Urban) scheme. With this approval, total number of affordable houses sanctioned under this scheme has reached 39.25 lakhs. 101. (A)  $a_c = 1 - S$  or  $100 - S\%$

$$= 100 - 60$$

$$= 40\%$$

104.(B) Taking moment about hinge  
 $F \times 1 = \text{Resultant of All forces} \times 0$   
 (Because the resultant will pass through the centre.)  
 $F \times 1 = 0$   
 $F = 0 \text{ kN}$

105.(C)  $\tan \theta = \frac{a_x}{a_z + g} = \frac{g}{0 + g} = 1 \quad (a_z = 0)$   
 So,  $\theta = 45^\circ$

107.(B)  $Q = 0.96 \times 0.3 \times \sqrt{0.2} = 0.128 \text{ m}^3 / \text{s}$

108.(D)  $Q_r = (L_r)_H (L_r)^{1.5}$   
 $\frac{Q_m}{Q_p} = \left(\frac{1}{1000}\right) \times \left(\frac{1}{100}\right)^{1.5}$   
 $Q_p = 10^5 \text{ m}^3 / \text{s}$

112.(A)  $\eta_o = \eta_m \times \eta_h$   
 $\Rightarrow \eta_h = \frac{\eta_o}{\eta_m} = \frac{0.70}{0.85}$   
 $\eta_h = 0.8235$

114.(A)  $\frac{Q}{ND^2} = \text{constant}$

118.(C) For butt welds, throat = thickness of plate  
 So,  $h = t$

119.(D) Initial tension,  $T_i = \frac{T_1 + T_2}{2}$   
 $T_i = \frac{T_1 + T_2}{2}$   
 $T_i = \frac{30 + 20}{2} = 25 \text{ KN}$

121.(B) For  $P_{\max}$ ,  
 $T_1 = 2T_c$   
 $T_1 = 2 \times 10 = 20 \text{ KN}$

122.(B) Spring index,  $C = \frac{D}{d} = \frac{4d}{d} = 4$   
 $C = 4$

131.(C)  $P_g = 25 \text{ bar}$   
 $P_a = 1.03 \text{ bar}$   
 $P_{\text{abs}} = P_g + P_a$   
 $= 25 + 1.03$   
 $P_{\text{abs}} = 26.03 \text{ bar}$

142.(D)  $T_c = 27^\circ\text{C} = 300\text{k}$   
 $T_E = -23^\circ\text{C} = 250\text{k}$   
 $(\text{COP})_{\text{carnot}} = \frac{300}{300 - 250}$   
 $= \frac{300}{50} = 6$

157.(B)  $a = 5\text{m/s}^2$

$t = 5 \text{ sec}$

$u = 0$

$S = ut + \frac{1}{2}a.t^2$

$S = 0 + \frac{1}{2} \times 5 \times 5^2$

$S = 62.5 \text{ m}$

159.(D)  $V = u - gt$

$0 = u - g \times 40$

$u = 40 \text{ g}$

and

$h = 40g \times 40 - \frac{1}{2}g \times 40^2$

$= 40^2 (g - g/2)$

$h = \frac{40^2 g}{2}$

time of downward journey

$h = 0 + \frac{1}{2}g.t^2$

$\frac{40^2 g}{2} = \frac{1}{2}g \times t^2$

$t = 40 \text{ sec}$

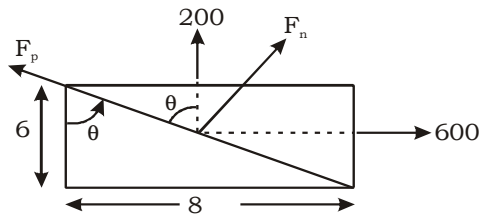
160.(D) Initial stretch of spring is 10 cm.

$\therefore$  Force in spring =  $1000 \times 0.1 = 100 \text{ N}$   
To further stretch it by 10 cm, new force will be 200 N

$\therefore$  Work to stretch by 10 cm

$= \left( \frac{100 + 200}{2} \right) \times 0.1 = 15 \text{ Nm}$

162.(B)



$\text{Sin}\theta = \frac{8}{10}$

$\text{Cos}\theta = \frac{6}{10}$

$F_n = 200 \sin \theta + 600 \cos \theta$

$= 200 \times \frac{8}{10} + 600 \times \frac{6}{10}$

$= 160 + 360$

$F_n = 520 \text{ kg}$

and

$F_p = 200 \cos \theta - 600 \sin \theta$

$= 200 \times \frac{6}{10} - 600 \times \frac{8}{10}$

$= 120 - 480$

$FP = -360 \text{ kg}$

163.(C) In winter inside temperature will drop and result in decrease of internal pressure. With a greater external pressure, the walls of the vessel are placed in compression with resultant buckling.

164.(A) First case

$\delta_1 = \frac{w.L^4}{8EI} = \frac{W.L^3}{8EI}$

Second case

$\delta_2 = \frac{w(L/2)^3}{3EI} + \frac{w(L/2)^2}{2EI} \cdot \frac{L}{2}$

$= \frac{W.L^3}{EI} \left[ \frac{1}{24} + \frac{1}{16} \right]$

$= \frac{5WL^3}{48EI}$

$\frac{\delta_1}{\delta_2} = \frac{WL^3/8EI}{5WL^3/48EI}$

$= \frac{48}{5 \times 8} = 6/5$

167.(C)

$K_{eq} = \frac{\frac{K}{2} \cdot 2K}{\frac{K}{2} + 2K}$

$= \frac{2K^2}{5K}$

$K_{eq} = 0.4K$

172.(C)  $T_e = \sqrt{T^2 + M^2}$

$5^2 = \sqrt{4^2 + M^2}$

$\therefore M = 3 \text{ kNm.}$