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2007, OUTRAM LINES, 1ST FLOOR, NEAR GTB NAGAR METRO STATION, GATE NO. - 2, DELHI-110009

**Answer-key & Solution**

**SSC JE (MECH)**  
**Practice Set-9**

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



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27. (C)  $98 \xrightarrow{-11} 87 \xrightarrow{-13} 74 \xrightarrow{-15} 59 \xrightarrow{-17} 42$
28. (D)  $436 \xrightarrow{-54} 382 \xrightarrow{-45} 337 \xrightarrow{-36} 301 \xrightarrow{-27} 274$
29. (B)  $4E \xrightarrow{+4} 8I \xrightarrow{+5} 13N \xrightarrow{+6} 19T \xrightarrow{+7} 26A$

30. (D) Infancy  $\rightarrow$  Childhood  $\rightarrow$  Adolescence  $\rightarrow$  Youth  $\rightarrow$  Adult

31. (A) 

|    |   |   |
|----|---|---|
| 8  | 3 | 4 |
| 7  | 6 | 1 |
| 2  | 4 | 1 |
| 13 | 5 | 4 |

 (Ist + Iind) - (IIIrd) = IVth  
 $(8 + 7) - 2 = 13$   
 $(3 + 6) - 4 = 5$   
 $(4 + 1) - 1 = 4$

32. (C) In the first column  $\sqrt{1+2+1} = \sqrt{4} = 2$   
 In the second column  $\sqrt{2+5+2} = \sqrt{9} = 3$   
 In the third column  $\sqrt{3+12+1} = \sqrt{16} = 4$   
 in the fourth column

$$\begin{aligned} \sqrt{2+10+x} &= \sqrt{12+x} = 5 \\ &= \sqrt{12+x} = 5 \\ &= 12+x = 25 \\ &x = 13 \end{aligned}$$

33. (D) 

|           |         |
|-----------|---------|
| $1^3-1$   | $2^3-1$ |
| 0         | 7       |
| <b>63</b> | 26      |
| $4^3-1$   | $3^3-1$ |

34. (A)

35. (D)  $7 \times 6 = 42 \Rightarrow 4 + 2 = 6$  (Middle no.)  
 $16 \times 9 = 108 \Rightarrow 1 + 0 + 8 = 9$  (Middle no.)  
 Similarly,  
 $18 \times 13 = 234 \Rightarrow 2 + 3 + 4 = 9$  (Middle no.)

36. (B) Mar April May June July Aug Sep Oct  
 code 3 + 2 + 3 + 2 + 3 + 3 + 2 + 3

$$= 21 \quad \frac{21}{7} = 3$$

Remainder = 0  $\rightarrow$  Then November starts with same day as march.

37. (A) Opposite of 4 is  
**1 2 3 4 5 6**  
 Ans  $\times \times \times \times \times \times$

38. (B) 

|   |   |   |
|---|---|---|
|   | F |   |
| A | E |   |
|   | B |   |
|   | C | D |

 $A \xleftrightarrow{\text{Opp.}} D$   
 $F \xleftrightarrow{\quad} B$   
 $E \xleftrightarrow{\quad} C$

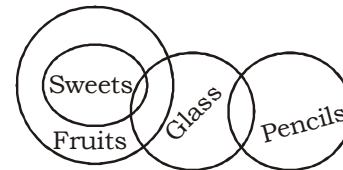
Hence only B possible.

39. (C) Both Mosquito and Ant are Pests.

40. (B)

41. (D)

or,



Either conclusion (I) or (III) follows.

42. (C) Given expression :

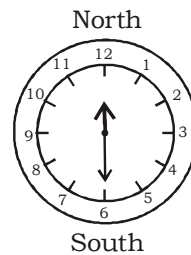
$$18 Q 12 P 4 R 5 S 6 = ?$$

As per question, changing the letters with mathematical operations.

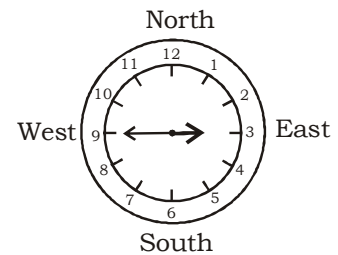
$$\begin{aligned} 18 \times 12 \div 4 + 5 - 6 \\ &= 18 \times 3 + 5 - 6 \\ &= 54 + 5 - 6 \\ &= 59 - 6 \\ &= 53 \end{aligned}$$

43. (D)  $34 + 12 = 46; \quad 46 \div 2 = 23$   
 $28 + 76 = 104; \quad 104 \div 2 = 52$   
 $97 + 39 = 136; \quad 136 \div 2 = 68$   
 Similarly  
 $37 + 73 = 110; \quad 110 \div 2 = 55$

44. (B)



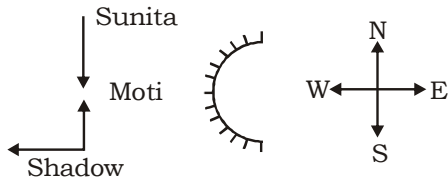
Time 12:30



Time 2:45

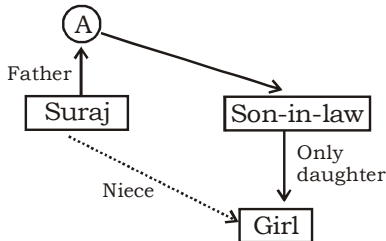
hence Minute hand will be in west direction.

45. (A) Sun is in east at the time of sunrise, so shadow will fall in west direction.



Hence, it is clear that Moti is facing north.

46. (A)



Hence, that girl is niece of Suraj

47. (A)

48. (D)

49. (A)

50. (D)

105. (B) For the given system  $Q = 0$  and work done is equivalent to simultaneous working of bulb, fan and electric iron.

$$W = 3[100 \times 60] \times \frac{1}{1000} = 180 \text{ kJ}$$

110. (C)  $\delta Q = \delta W + du$

$$-400 = -1000 + du; du = 600 \text{ J}$$

$\therefore$  Change in specific internal energy

$$du = \frac{600}{2} = 300 \text{ J / kg}$$

111. (A) For a process  $\delta Q = \delta W + du$

For all the three paths,  $dU$  remains same. Accordingly the order of  $Q_1$ ,  $Q_2$  and  $Q_3$  will be same as that of work done during corresponding paths. Since work done is given by the area under the path curve,

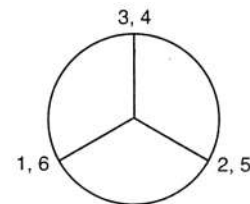
$$Q_1 < Q_2 < Q_3$$

114. (B)  $\eta_{th} = \frac{W}{Q_1} = \frac{Q_1 - Q_2}{Q_1}$

$$Q_1 - Q_2 = \frac{1}{4} Q_2 \quad (\text{given})$$

$$\eta_{th} = \frac{\frac{1}{4} Q_2}{\frac{5}{4} Q_2} = 0.2 \text{ or } 20\%$$

118. (B) In a six cylinder engine, the firing interval is  $720/6 = 120^\circ$  and the corresponding spacing of cranks is shown in the adjoining figure.



122. (C) In a reciprocating compressor, one should aim at compressing the air isothermally with exponent  $n$  in the compression process  $p v^n = \text{constant}$  equal to unity. With this, work input to the compressor will be least. However, then the engine operation will be at slow speeds.
130. (B) For a vertically immersed surface.
- $$y_p = y_c + \frac{I_c}{A y_c} = \frac{h}{2} + \frac{b h^3 / 12}{b h \times h / 2} = \frac{2}{3} h$$
131. (C) For equilibrium, the total upthrust equals the downward force. If  $V$  is the volume of sphere, then
- $$13.6g \times \frac{V}{2} + 0.8g \times \frac{V}{2} = \rho g \times V$$
- $$\rho = 7.2 \text{ g/cm}^3$$
140. (D) Poise is unit of dynamic viscosity
- $$1 \text{ poise} = 1 \frac{\text{dyne sec}}{\text{cm}^2} = 10^{-5} \frac{\text{Ns}}{10^{-4} \text{m}^2} = 0.1 \frac{\text{Ns}}{\text{m}^2}$$
- Apparently viscosity expressed in  $\frac{\text{Ns}}{\text{m}^2}$  is converted into poise unit of viscosity by multiplying with 10.
143. (B)  $F = \rho A V^2 = (0.7 \times 1000) \times 0.03 \times 10^2 = 2100 \text{ N} = 2.1 \text{ kN}$
145. (B) In a modern Francis turbine, the water enters the runner radially and leaves axially, and accordingly it is a mixed-flow type turbine.
148. (B) Specific speed is a characteristic index number which serves to identify the type of turbine.
- For a Pelton wheel  
 $N_s = 10$  to  $25$  for a single jet  
 $= 50$  for a double jet  
 For a Francis turbine :  $N_s = 50$  to  $300$   
 For a Kaplan turbine :  $N_s = 300$  to  $1000$
150. (A) Unit power of the turbine
- $$P_u = \frac{P}{H^{3/2}} = \frac{640}{(16)^{3/4}} = 10 \text{ kW}$$
160. (B) Material of the belt is elastic and accordingly, the belt elongates more on the tight side than on the slack side resulting in unequal stretching. Since, the peripheral speed of a pulley depends upon the length of belt received by it, the driven pulley shall run at a smaller peripheral speed than the driving pulley. This partial slipping due to elastic property of the belt material is called creep.
162. (C) The governor controls the supply of working fluid to the engine in accordance with varying load conditions, and keeps the mean speed within certain limits.
165. (C) Coefficient of fluctuation of speed is defined as the ratio of maximum fluctuation of speed to mean speed. That is
- $$C_f = \frac{\omega_{\max} - \omega_{\min}}{(\omega_{\max} + \omega_{\min}) / 2} = \frac{2\omega_{\max} - 2\omega_{\min}}{\omega_{\max} + \omega_{\min}}$$
- $$C_f \omega_{\max} + C_f \omega_{\min} = 2\omega_{\max} - 2\omega_{\min}$$
- $$\therefore \frac{\omega_{\max}}{\omega_{\min}} = \frac{2 + C_f}{2 - C_f}$$
172. (C) The Young's modulus is a property of the material and its value is independent of magnitude of force, geometrical configuration of the body, and type of loading (tension or compression.)