Answer-key & Solution

SSC JE (Mechanical)
Practice Set-12

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

Note : *If your opinion differ regarding any answer, please message the mock test and Question number to 8375805483*

Note : *If you face any problem regarding result or marks scored, please contact : 9313111777*
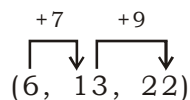
SOLUTION SSC JE (Mechanical) Practice Set-12

1. (C) First is an improper form of the second.
2. (C) Drama is performed on a Stage. Similarly, Tennis is played in court.
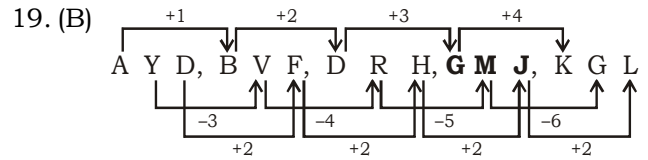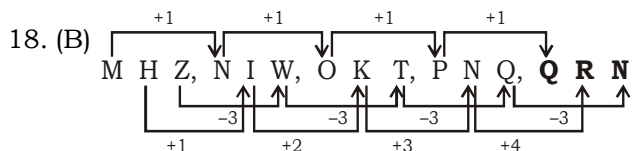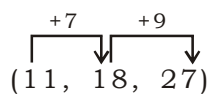3. (D) L O G I C : B H F N K :: C L E R K : **J Q D K B**
4. (C) P A L E : L E A P :: P O S H : **S H O P**
5. (C) B Y C X : D W E V :: F U G T : **H S I R**
6. (C) The relation is $x : \dfrac{x^2}{2}$
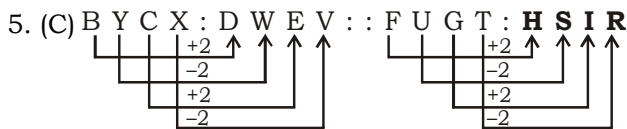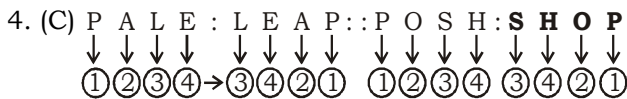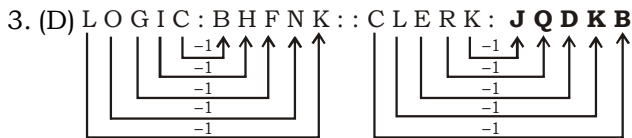
$$4 : \dfrac{4^2}{2} = 4 : 8$$

7. (D) $5^2 = 25$
   $(5 + 1)^2 + 1 = 37$
   Similarly, $7^2 = 49$ and $(7 + 1)^2 + 1 = 65$
8. (C) All except Brigadier are ranks in navy.
9. (B) Other options are carbon or its allotropes.
10. (D) All other groups contains three consecutive letters, though not in order.
11. (D) In all other groups, one letter is repeated three times.
12. (B) In all other groups, the small letters are vowels.
13. (D) Small letters are at odd places and capital letters are at even places in each option.
14. (B) In all other pairs, the first number is seven times the second number.
15. (D) In all other pairs, the ratio of the two numbers is 8 : 9.
16. (D) In all other pairs, the difference between the two numbers is multiple of 9.
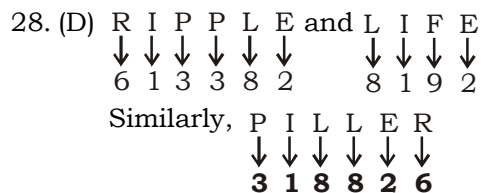17. (C) Given set :

   $$\overset{+7}{(6,} \quad \overset{+9}{13,} \quad 22)$$

   following the same sequence :
   option (C) follows :

   $$\overset{+7}{(11,} \quad \overset{+9}{18,} \quad 27)$$

18. (B) M H Z, N I W, O K T, P N Q, **Q R N**

19. (B) A Y D, B V F, D R H, **G M J**, K G L

20. (D) Reverse the letter
21. (A) The number of letters is the terms goes on leaving one letter after each set and the next set has one letter more than the previous one.
22. (C) 1, 2, 5, 12, 27, 58, 128, ?
   $1 \times 2 + 0 = 2$
   $2 \times 2 + 1 = 5$
   $5 \times 2 + 2 = 12$
   $12 \times 2 + 3 = 27$
   $27 \times 2 + 4 = 58$
   $58 \times 2 + 5 = 121$
   $121 \times 2 + 6 = 248$
   ∴ missing number = $121 \times 2 + 6 = 248$
23. (A) The patters is
   n^{th} term + $(n + 1)^{th}$ term + $(n + 1) = (n + 2)^{th}$ term.
   This,
   1st term + 2nd term + 2 = 3rd term and so on
   ∴ missing term = 6th term
   = 4th term + 5th term + 5
   = 24 + 41 + 5 = 70
24. (A) The given numbers are sequence of prime numbers.
25. (B) The pattern is +1, + 1 + 2, + 1 + 2 + 3, and so on.
   ∴ missing no = 15 + (1 + 2 + 3 + 4) = 25
26. (D) The series is b**a**ac/**a**cc**b**/cb**b**a/b**a**ac
27. (B) The series is c**c**ac**c**/aa**b**aa/**b**bc**b**b/cc
28. (D) R I P P L E and L I F E
   6 1 3 3 8 2   8 1 9 2
   Similarly, P I L L E R
   3 1 8 8 2 6
29. (B) her idea has merit → fo la bu na

   merit list has been displayed → jo ke la Si na

   her name displayed there → ya Si bu zo

   name in merit list → na ya go ke

   la → has

30. (D)   31. (C)   32. (B)

33. (C)

Alok/Shubhash, Suresh, Umesh, Praveen, Subhash/Alok, Pramod
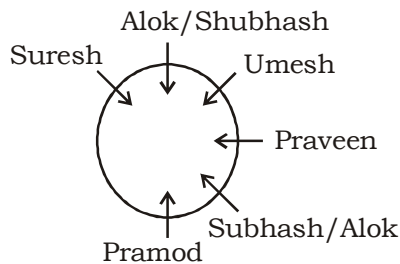
34. (A) $\dfrac{Lucknow}{1}, \dfrac{Uttar\ Pradesh}{2}, \dfrac{India}{3}, \dfrac{Asia}{5}, \dfrac{World}{4}$

35. (D) First column $\rightarrow 2^3 + 1^3 + 3^3 = 36$
    Third column $\rightarrow 0^3 + 4^3 + 3^3 = 91$
    Similarly,
    In second column $\rightarrow 4^3 + 2^3 + 1^3$
    $= 73$

36. (A) First column $\rightarrow 4^2 + 2^2 + 1^2 = 21$
    Second column $\rightarrow 5^2 + 3^2 + 8^2 = 98$
    Similarly,
    Third column $\rightarrow 6^2 + 7^2 + 3^2 = 94$

37. (D) $7 \times 2 + 1 = 15$
    $15 \times 2 + 1 = 31$
    $31 \times 2 + 1 = 63$
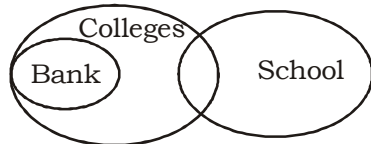 $63 \times 2 + 1 = 127$
    $127 \times 2 + 1 = 255$

38. (C) First row $= (8 \times 2) + 17 = 33$
    Second row $= (12 \times 2) + 5 = 29$
    Third row $= (10 \times 2) + 13 = 33$

39. (D) First row $\rightarrow (85 \div 5) + 3 = 20$
    Second row $\rightarrow (126 \div 6) + 3 = 24$
    Third row $\rightarrow (175 \div 7) + 3 = 28$

40. (C) Total number
    $= (2008 - 1997) + 3 = 11 + 3 = 14$
    Now, dividing 14 by 7, remainder = 0
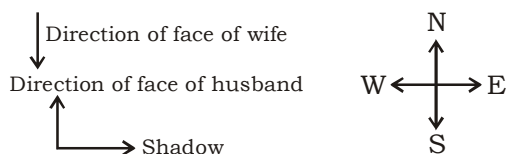   Hence, required day
    $= $ Saturday $+ 0 = $ Saturday

41. (C)   42. (C)

43. (C)

Colleges, Bank, School

44. (C) $24 \div 2 = 4 \times 3$
    $12 = 12$

45. (C) Sun will be in the west at the time of sunset. So at this time shadow will be formed in east direction. According to the question,

Direction of face of wife
Direction of face of husband
Shadow
N, W, E, S

Clearly, husband was walking towards north direction. Hence, wife was walking towards south direction.

46. (D) She may be the mother or aunt of Mukesh.

47. (D)   48. (B)   49. (A)   50. (C)

104. (C) The necessary conditions for a body to be called a projectile are
    (i) It should be given some initial velocity
    (ii) It should move under the action of gravity alone there should not be any other driving force

105. (A) Wire drawing implies large permanent deformation in tension and for that materials should have high ductility. Malleability enables metals and alloys to be rolled into sheets, i.e. undergo plastic deformation in compression.

110. (A) $\sigma_1 = \dfrac{pd}{4t}; \sigma_2 = \dfrac{pd}{4t}$

    Strain $\varepsilon_1 = \dfrac{\sigma_1}{E} - \mu \dfrac{\sigma_2}{E} = \dfrac{pd}{4tE}(1 - \mu)$

112. (A) $Z_S = \dfrac{\pi(D_0^4 - D_I^4)}{16 D_0}$ for a hollow shaft

    $= \dfrac{\pi}{16 \times 10}(10^4 - 5^4) = 184\ cm^3$

114. (B) The situation corresponds to a column with one end fixed and the other pin joined.

116. (C) The constrained motion has been achieved by some means other than elements forming the pair.

117. (D) Coriolis component of accn $= 2v\omega$

    $= 2 \times 10 \times \left(\dfrac{2\pi \times 60}{60}\right) = 40\pi\ cm/\sec^2$

124. (D) $p_c \times p_d = \pi; p_d = \pi/15 = 0.21$ mm

128. (C) The factors of safety recommended for riveted boiler joints are given below:
    Lap joint: 4.75
    Single strap butt joint: 4.75
    Butt joint with two unequal cover straps: 4.25
    Butt joint with two equal straps: 4.0

132. (B) An ideal plastic has a definite stress and constant linear relation between shear stress developed and rate of deformation.

135. (A) For a hollow bubble: $(p_i-p_0) = \dfrac{8\sigma}{d}$

$\sigma = \dfrac{25 \times 0.05}{8} = 0.156 \, N/m$

136. (A) Pressure excess is inversely proportional to size of the bubble and, therefore, the pressure inside the larger bubble (radius 2r) would be half the pressure inside the smaller bubble (radius r).

139. (D) Since the metallic piece and mercury has the same specific gravity, the metal piece becomes a part of mercury. As such whole of metal piece will get immersed with its top surface just at mercury level.

141. (B) Streamline spacing varies inversely as the velocity; converging of streamlines in any particular direction shows accelerated flow in that direction.

142. (D) For a two dimensional flow field the differential equation of streamline is given by $\dfrac{dx}{u} = \dfrac{dy}{v}; \dfrac{dy}{dx} = \dfrac{v}{u}$

148. (B) Navier stokes equation represent the conservation of momentum, are equations of motion for viscous fluid and consider combination of gravity, pressure and viscous forces.

149. (B) The velocity distribution in the flow field between two fixed parallel flat plates separated by a small gap b is

$u = \dfrac{1}{2\mu}\left(\dfrac{-dp}{dx}\right)(by - y^2)$

Evidently the velocity profile is parabolic with its vertex at the centre line of the flow passage.

150. (C) For one dimensional incompressible flow between parallel plates

$V_{av} = \dfrac{2}{3}V_{max} = \dfrac{2}{3} \times 6 = 4m/s$

155. (B) $F_1 = \rho AV^2$

$F_2 = \rho A(V - u)^2 = \rho A(V - V/3)^2 = \dfrac{4}{9}\rho AV^2$

$\therefore$ Ratio $\dfrac{F_1}{F_2} = 9:4$

156. (A) The net head is the effective head and is defined as the head available at the inlet of turbine.
Net head H = H_g - h_f

157. (B) A spear or needle is so arranged that it can move forward or backward thereby decreasing or increasing the annular area of the nozzle passage. That regulates the water flow through the nozzle.

163. (B)

$\Delta S_2 = \dfrac{Q}{500} = 10kJ/K$

$Q = 5000kJ$

$\Delta S_1 = \dfrac{-Q}{1000} = -\dfrac{5000}{1000} = -5kJ/k$

164. (D) $T_1 = 273 + 12 = 285$ K, $T_2 = 273 + 2 = 275$ K

$Q_1 = 57$ J/cycle $= 57 \times \dfrac{1080}{60} = 1026W$

$h = 1 - \dfrac{T_2}{T_1} = 1 - \dfrac{275}{285} = 0.035 = \dfrac{W}{Q_1}$

W = 1026 × 0.035 = 36 W