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

Answer-key & Solution

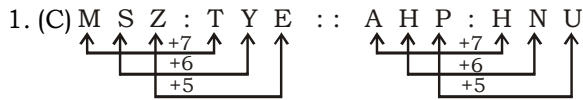
SSC JE (Mechanical)
MOCK -(54)
Date 02 / 07 / 2016

1. C	26. A	51. A	76. B	101. D	126. A	151. A	176. D
2. B	27. A	52. C	77. B	102. D	127. C	152. B	177. D
3. c	28. C	53. D	78. B	103. B	128. C	153. C	178. D
4. C	29. B	54. B	79. C	104. B	129. B	154. A	179. D
5. C	30. D	55. C	80. C	105. A	130. C	155. D	180. D
6. C	31. C	56. A	81. D	106. C	131. A	156. B	181. C
7. A	32. D	57. C	82. A	107. D	132. B	157. C	182. A
8. D	33. B	58. A	83. B	108. A	133. D	158. A	183. D
9. C	34. A	59. C	84. A	109. C	134. A	159. C	184. A
10. D	35. C	60. A	85. D	110. C	135. D	160. A	185. B
11. D	36. D	61. B	86. C	111. A	136. D	161. D	186. D
12. D	37. d	62. D	87. B	112. C	137. D	162. C	187. B
13. C	38. B	63. B	88. B	113. B	138. D	163. A	188. B
14. A	39. D	64. B	89. B	114. D	139. C	164. B	189. C
15. D	40. B	65. B	90. C	115. A	140. B	165. C	190. C
16. B	41. B	66. A	91. B	116. D	141. D	166. C	191. B
17. C	42. B	67. B	92. B	117. D	142. B	167. C	192. B
18. B	43. D	68. B	93. A	118. A	143. C	168. C	193. C
19. C	44. B	69. B	94. A	119. C	144. A	169. A	194. C
20. C	45. D	70. D	95. D	120. C	145. C	170. C	195. C
21. c	46. C	71. A	96. A	121. D	146. D	171. B	196. A
22. D	47. A	72. A	97. C	122. B	147. C	172. C	197. D
23. A	48. A	73. B	98. A	123. D	148. A	173. D	198. B
24. D	49. B	74. B	99. A	124. B	149. C	174. B	199. D
25. B	50. D	75. D	100. A	125. A	150. A	175. D	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 () MOCK TEST no. 54



2. (B) Here, $13 \times 14 = 182$
Similarly, $18 \times 19 = 342$
Hence, the question mark should be replaced by 18.

3. (C) £ is the currency of England. Currency of China has sign ¥.

4. (C) COME : 36 :: SUN : 54
 $3+15+13+5 = 36$ $19+21+14 = 54$

5. (C) Blue whale is the biggest animal in sea. In the same way Elephant is the biggest animal on land.

6. (C) Life and Death are opposite. In the same way Hope and Despair are opposite to each other

7. (A) Unemployment brings poverty. In the same way Malnutrition brings Anaemia.

8. (D) (A) $(11)^2 + (11 - 2) = 130$
(B) $(18)^2 + (18 - 2) = 340$
(C) $(15)^2 + (15 - 2) = 238$
(D) $(17)^2 + (17 - 2) = 304$

9. (C) KP HS QJ IR
 $11+16=27$ $8+19=27$ $17+10=27$ $9+19=27$

↓
Except 'C' 1st letter is after the 11th letter in Alphabet series.

10. (D) All are primary colours except Black.

11. (D) All are related to time except Again.

12. (D)

13. (C) $7 \xrightarrow{\times 3+6} 27 \xrightarrow{\times 2-6} 48 \xrightarrow{\times 3+6} 150 \xrightarrow{\times 2-6} 294 \xrightarrow{\times 3+6} 888$

14. (A) $52 \xrightarrow{7^2+3} 124 \xrightarrow{11^2+3} 172 \xrightarrow{13^2+3} 292 \xrightarrow{17^2+3} 364$

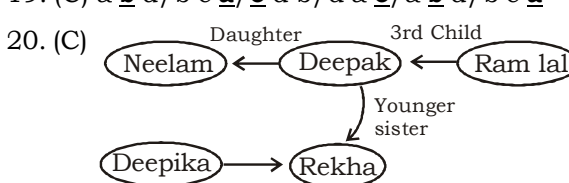
15. (D) B C E G K M Q
2 3 5 7 11 13 17

16. (B) $324 \xrightarrow{+111} 435 \xrightarrow{+111} 546 \xrightarrow{+111} 657 \xrightarrow{+111} 768$

17. (C) DGK MPT VYC EHL NQU
 $4 \xrightarrow{+3} 7 \xrightarrow{+4} 11 \xrightarrow{+2} 13 \xrightarrow{+3} 16 \xrightarrow{+4} 20 \xrightarrow{+2} 22 \xrightarrow{+3} 25 \xrightarrow{+4} 29 \xrightarrow{+2} 31 \xrightarrow{+3} 34 \xrightarrow{+4} 38 \xrightarrow{+2} 40$

18. (B) $2 \xrightarrow{\times 2.5} 5 \xrightarrow{+3} 8 \xrightarrow{\times 2.5} 20 \xrightarrow{+3} 24 \xrightarrow{\times 2.5} 60 \xrightarrow{+3} 65 \xrightarrow{\times 2.5} 162.5$

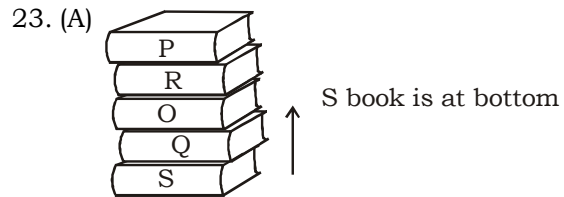
19. (C) a b d / b c a / c d b / d a c / a b d / b c a



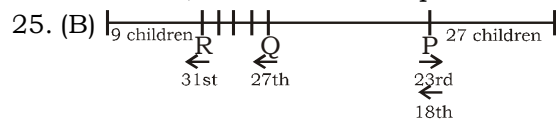
21. (C) $95 D 19 R 11 S 28 A 17$
 $5 \times 11 - 28 + 17 = 55 - 11 = 44$

22. (D) One complete circle = 360°
 $n \times 24^\circ = 360^\circ$
 $n = \frac{360}{24} = 15$

One side = 18 M
Then total Distance = $18 \times 15 = 270$ m

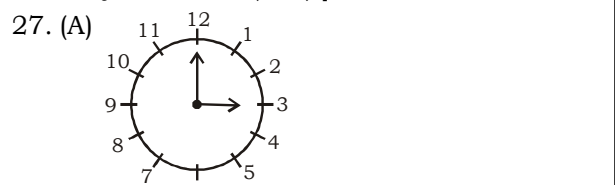


24. (D) F ← Father M ← Sister D
T ← Mother R ← Brother
It is not given whether 'D' is a male or a female, So Data is inadequate



Now, the total number of children between P and R is
 $31 - 18 = 13$

26. (A) Here,
1st January 2003 : Wednesday
31st December 2003 : Wednesday
1st January 2004 : Thursday
31st December 2004 : Friday
[Note that if a non-leap year starts with the day x then the last day of the year will be x. Whereas if a leap year starts with the day x then the last day of the year will be (x+1).]



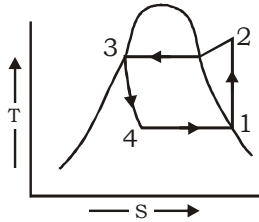
Between 3 and 4 minute hand 24°

behind mean $\Rightarrow \frac{24}{6} = 4$ min gap.

$(15-4) = 11$ min

$11 \times \frac{12}{11} = 12$ min. So, 12 min, past 3

109. (C)



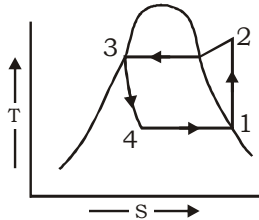
$$COP = \frac{RE}{W_{in}} = \frac{h_1 - h_4}{h_2 - h_1} = \frac{h_1 - h_3}{h_2 - h_1}$$

(Since $h_4 = h_3$)

111. (A) $\eta = 1 - \frac{1}{r^{\gamma-1}} = \frac{1}{(8.5)^{0.4}} = 57.5\%$

114. (D) The Triple point is a line on the P-V diagram where all the three phases solid, liquid and gases exist in equilibrium. At a pressure below the triple point line, the substance cannot exist in liquid phase and the substance when heated, transforms from solid to vapour by absorbing the latent heat of sublimation from the surroundings.

118. (A)



$$h_2 = 283 \text{ kJ/kg}$$

$$h_3 = h_4 = 116 \text{ kJ/kg}$$

$$h_1 = 232 \text{ kJ/kg}$$

$$COP = \frac{h_1 - h_4}{h_2 - h_1} = \frac{232 - 116}{283 - 232}$$

$$COP = 2.27$$

120. (C) Efficiency of Otto cycle, $\eta = 60\%$

Ratio of specific heats, $\gamma = 1.5$

Efficiency of Otto cycle is given by,

$$\eta_{otto} = 1 - \frac{1}{(r)^{\gamma-1}}$$

$$0.6 = 1 - \frac{1}{(r)^{1.5-1}}$$

$$1 - \frac{1}{(r)^{0.5}} = 0.4$$

or $(r)^{0.5} = \frac{1}{0.4} = 2.5$

$$r = 6.25$$

137. (D) Poisson's ratio = $\frac{\text{Lateral strain}}{\text{Longitudinal strain}}$

$$\frac{\text{Lateral strain}}{4 \times \text{Longitudinal strain}} = 0.25$$

$$\text{But, } G = \frac{E}{2(1+\mu)} = \frac{2 \times 10^5}{2(1+0.25)} = 0.8 \times 10^5 \text{ N/mm}^2$$

138. (D) If a body is allowed to expand or contract freely with rise or fall of temperature then no stresses are induced in the body.

141. (D) $N = \frac{n(n-1)}{2} = \frac{10 \times (10-1)}{2} = 45$

142. (B) Clearance is the amount by which the dedendum of a gear exceeds the addendum of its mating tooth.

144. (A) Base circle diameter = $D \cos \phi$
Hence

$$\frac{\text{Base circle diameter}}{\text{Pitch circle diameter}} = \cos \phi$$

Where D = Pitch circle diameter

146. Sensitivity = $\frac{\text{Mean speed}}{\text{Range of speed}}$

For isochronous governor range of speed = 0

hence sensitivity = ∞

150. (A) Base circle is the smallest circle tangent to the cam profile and concentric with the cam. The base circle decides the overall size of the cam and is therefore a fundamental feature of the cam.

154. (A) Sommerfield number is used in the designing of hydrodynamic bearing while dynamic capacity static capacity is the term used in rolling contact bearing.

155. (D) Frictional torque transmitted

$$T_f = \frac{1}{2} \mu WR (\text{Uniform wear})$$

$$T_f = \frac{2}{3} \mu WR (\text{Uniform pressure})$$

158. (a) Maximum shear stress = $\frac{16T}{\pi d^3}$

$$\text{Normal stress} = 0$$

159. (c) $\frac{T}{J} = \frac{\tau_{max}}{R}$

$$\Rightarrow T = \tau_{\max} \times \frac{J}{R}$$

$$= 125 \times \frac{\pi}{32} \times (100^4 - 50^4) \times \frac{2}{100} \times 10^{-6}$$

$$= 23 \text{ kN-m}$$

165. (c) $dW = -9000 \text{ kJ}$, $dQ = -3000 \text{ kJ}$

$$W_{\text{ext}} + dW = dQ$$

$$W_{\text{ext}} = dQ - dW = -3000 + 9000 = 6000 \text{ kJ}$$

168. (C) $(\text{COP})_{\text{HP}} = 4$

$$(\text{COP})_{\text{Ref}} = (\text{COP})_{\text{HP}} - 1 = 4 - 1 = 3$$

$$= \frac{Q}{W} = \frac{Q}{3}$$

$$Q = 9 \text{ kW or } 540 \text{ kJ/min}$$

177. (D) Weight in air = Weight in water + ρv

$$3 = 2.5 + 1000 V$$

$$V = \frac{0.5}{1000}$$

$$S.G = \frac{\text{wt. in air}}{\rho V} = \frac{3 \times 1000}{0.5 \times 1000} = 6$$

181. (C) In USM some kind of abrasive slurry is used and there is hammering action between tool and workpiece.

182. (A) Maximum heat is carried away by chip. (80% of the total heat generated).

183. (D) Straddle milling is a special form of Gang milling where only side and face milling cutters are used.

185. (B) In down milling, also called climb milling, the feed direction of the workpiece is same as that of the cutter rotation.

191. (B) Tube drawing is done by following:

- (a) Tube sinking operation
- (b) Tube drawing with fixed mandrel
- (c) Tube drawing with floating mandrel
- (d) Tube drawing with moving mandrel

197. (D) Sprue is a vertical passage the parting plane through which molten metal from the pouring basin reaches the mould cavity.

200. (C) The shielding gases most commonly used are argon, helium, carbon dioxide and mixture of them.