

*KD*  
**Campus**  
**K D Campus Pvt. Ltd**

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

**Answer-key & Solution**

**SSC JE (MECH)**  
**Practice Set-16**

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

1. (A) E C A : K I G :: Q O M : W U S

2. (D) A B N O : C D P Q :: E F R S : G H T U

3. (A)                      4. (B)                      5. (B)

6. (A) 3 2 4 : C B D :: 4 5 6 : D E F

7. (D) 9 : 80 :: 100 : 9999

8. (A) 56 : 29 :: 38 : 20

9. (A) Except option (A) all are perfect square

10. (C) (A) 8 — 64                      (B) 12 — 144  
                      $\uparrow$  Square                       $\uparrow$  Square  
 (C) 17 — 279                      (D) 13 — 169  
                      $\uparrow$  Not Square                       $\uparrow$  Square

11. (B) All are types of clothes

12. (C)

13. (B) (A) K M N                      (B) G H I  
                      $\uparrow$ +2  $\uparrow$ +1  $\uparrow$                        $\uparrow$ +1  $\uparrow$ +1  $\uparrow$   
 (C) D F G                      (D) O Q R  
                      $\uparrow$ +2  $\uparrow$ +1  $\uparrow$                        $\uparrow$ +2  $\uparrow$ +1  $\uparrow$

14. (A) (A) B D C B                      (B) C D E C  
                      $\uparrow$ -1  $\uparrow$                        $\uparrow$ +1  $\uparrow$   
                     Same                      Same  
 (C) G H I G                      (D) P Q R P  
                      $\uparrow$ +1  $\uparrow$                        $\uparrow$ +1  $\uparrow$   
                     Same                      Same

15. (D) (A) 589  $\Rightarrow$  5 + 8 + 9 = 22  
 (B) 886  $\Rightarrow$  8 + 8 + 6 = 22  
 (C) 697  $\Rightarrow$  6 + 9 + 7 = 22  
 (D) 398  $\Rightarrow$  3 + 9 + 8 = 20

16. (D) 

Package	Palace	Passport	Patience	Picture
3	5	1	4	2

17. (C) 1, 4, 7 ; 2, 3, 6 ; 5, 8, 9

18. (A) 

Root	Stem	Leaf	Bud	Flower
4	1	2	5	3

19. (A)

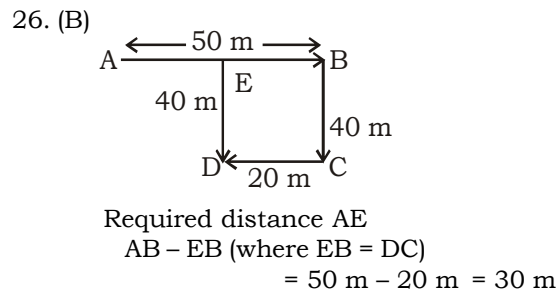
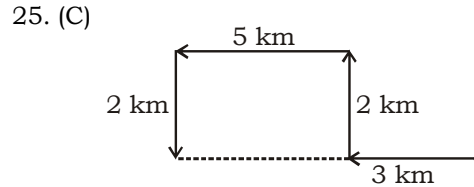
20. (B) R U X A D G

21. (B) A F K E J O I N S M R W

22. (C) 2 14 38 86 182 374

23. (A) 3 4 12 13 39 40 120 121 363

24. (B) p q / r r p q / r r p q / r r



27. (B) Middle

28. (D) 11

29. (C)

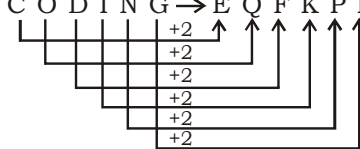
Present age	Their age 8 years later
Son $x$	$x + 8$
Mr. Rao $12x$	$12x + 8$

Now  $12x + 8 = 4(x + 8)$   
 $8x = 24$

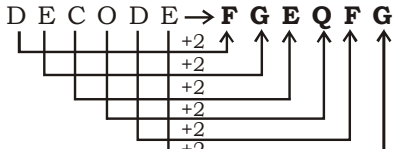
$x = 3$  years  
present age of Mr. Rao  
 $= 12x = 12 \times 3 = 36$  years

30. (C) Mohan's rank from bottom  
 $20 - 13 + 1 = 8$

31. (B) Required average age  
 $= \frac{40 \times 8 - 55 + 39}{8} = \frac{304}{8} = 38$  years  
 $= 38$  years

32. (B) C O D I N G → E Q F K P I  


Similarly,

D E C O D E → F G E Q F G  


33. (A) T W E N T Y and E L E V E N  
 ↑ ↑ ↑ ↑ ↑     ↑ ↑ ↑ ↑ ↑  
 8 6 3 9 8 5     3 2 3 0 3 9

then,

T W E L V E  
 ↑ ↑ ↑ ↑ ↑  
 8 6 3 2 0 3

34. (B) Sunita ↑  
 Rashmi ↑  
 Shyam ↑  
 Radha ↑  
 Geeta ↑

35. (A)

A is the Son of B and B is the Sister of F.  
So A will be Nephew of F.

36. (D) NEST

37. (D) REFER

38. (B)                      39. (C)                      40. (D)

41. (B)  $(4 \times 7) + (12 \div 3) = 32$   
 $(5 \times 8) + (11 \div 1) = 51$   
 Similarly,  
 $(9 \times 3) + (6 \div 2) = 30$

42. (A)  $7 \times 9 \times 3 = 189$

$8 \times 4 \times 9 = 288$

Similarly,

$9 \times 5 \times x = 90$

$45x = 90$

$x = 90 \div 45 = 2$

43. (D)  $30 \div 10 \times 12 - 8 + 12 = 40$

$3 \times 12 - 8 + 12 = 40$

$36 - 8 + 12 = 40$

$36 + 12 - 8 = 40$

$48 - 8 = 40$

$40 = 40$

44. (A)

45. (B)  $133 = 70 \Rightarrow 1 + 3 + 3 = 7 \times 10 = 70$

$426 = 120 \Rightarrow 4 + 2 + 6 = 12 \times 10 = 120$

Similarly,

$565 = 5 + 6 + 5 = 16 \times 10 = 160$

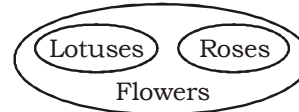
46. (C)

47. (C)

48. (A)

49. (C)

50. (D)



101. (D) Increase in entropy of a system leads to increase in randomness and degradation of energy.

105. (A) For efficiency to be equal

$$T_2 = \sqrt{T_1 T_3}$$

$$T_3 = \sqrt{900 \times 400} = 600\text{K}$$

107. (D) For isothermal process

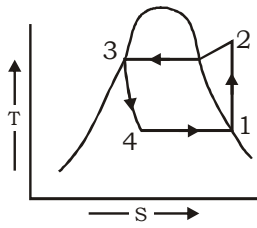
$$PV = \text{Constant}$$

$$PdV + VdP = 0$$

$$PdV = -VdP$$

108. (A) In aircraft, air refrigeration cycle is used due to low weight per tonne of refrigeration on the other hand COP of this cycle is very low.

109. (C)



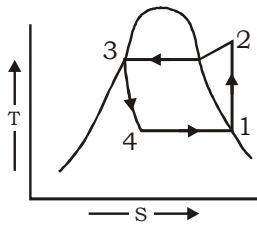
$$COP = \frac{RE}{W_{in}} = \frac{h_1 - h_4}{h_2 - h_1} = \frac{h_1 - h_3}{h_2 - h_1}$$

(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 =  $\infty$

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 +  $\rho v$

$$3 = 2.5 + 1000 V$$

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

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

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.