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

Answer-key & Solution

SSC JE (Mechanical)
MOCK -(82)
Date 21/ 01/ 2017

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

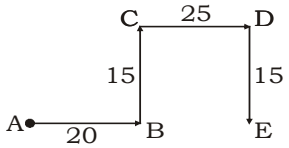
Correction Mock Test 81
(157. C, 158. C, 178. C, 180. D)

Note : *If your opinion differ regarding any answer, please message the mock test and Question number to 9560620353*

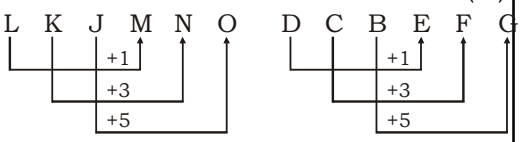
Note : *If you face any problem regarding result or marks scored, please contact : 9313111777*

SOLUTION SSC JE (Mechanical) MOCK TEST no. 82

1. (A) Ink is used for writing, similarly Colour is used for painting.
2. (C) CHAIR $\xrightarrow{\text{Reverse}}$ RIAHC
   Similarly,
   TABLE $\xrightarrow{\text{Reverse}}$ ELBAT
3. (B) 6 + 15 = 21
   3 + 15 = **18**
4. (B) 72 ⇒ (7 + 2) × 2 = 18
   56 ⇒ (5 + 6) × 2 = **22**
5. (C) Brick is used by Mason and Colour is used by painter.
6. (A) '064' is only the square of a number in the given options.
7. (D) Except Agra, all are hill-stations.
8. (B) 61 is the only prime number in the given options.
9. (D) Except 'Boat', all run on road.
10. (D) Q F(6) + E(5) + E(5) + D(4) = 20
    B(2) + R(18) + E(5) + A(1) + D(4) = **30**
11. (A) SCO**U**T
12. (D) 1→ 5 → 4 → 2 → 3
13. (C) b c a a / b c a a / b c a a / b c a a
    ⇒ acab
14. (D)



    ∴ Required distance = 20 + 25 = 45 m
15. (A) + ⇒ ÷, × ⇒ +
    – ⇒ × ÷ ⇒ –
    36 – 6 + 3 × 5 ÷ 3 = 74
    ⇒ 36 × 6 ÷ 3 + 5 – 3 = 74
    ⇒ 36 × 2 + 5 – 3 = 74
    ⇒ 72 + 5 – 3 = 74
    ∴ 74 = 74
16. (C) A C F J O U B
    +2 +3 +4 +5 +6 +7
17. (A) 17 14 15 12 13 10 11
    –3 +1 –3 +1 –3 +1
18. (A)
19. (D) (24 × 2) + 5 = 48 + 5 = 53
    (51 × 4) + 7 = 204 + 7 = 211
    (67 × 6) + 5 = 402 + 5 = **407**
20. (C)
21. (B) 1 × 10 ⇒ (1 × 10) – 1 = 9
    2 × 10 ⇒ (2 × 10) – 2 = 18
    3 × 10 ⇒ (3 × 10) – 3 = 27
    8 × 10 ⇒ (8 × 10) – 8 = **72**
22. (B) 23. (C)
24. (C) 6 + 3 ⇒ 3 × 6 – (6 – 1) = 18 – 5 = 13
    5 + 20 ⇒ 5 × 20 – (5 – 1) = 100 – 4 = 96
    11 + 7 ⇒ 11 × 7 – (11 – 1) = 77 – 10 = 67
    19 + 11 ⇒ 19 × 11 – (19 – 1) = 209 – 18 = 191
25. (C) C ⇒ 02, **11**, 23, 32, 40
    A ⇒ 00, 13, 21, **33**, 42
    R ⇒ **57**, 68, 77, 88, 99
    D ⇒ 03, 10, **22**, 30, 41
26. (D) Havana is the capital of Cuba and Nicosia is the capital of Saipras.
27. (D)



28. (B) Kangaroo is the national animal of Australia and Reindeer is the national animal of Siberia.
29. (A) Brick is used in wall. Similarly,
    Tile is used in Roof.
30. (A) $(7)^2 - 1 = 49 - 1 = 48$
    $(12)^2 - 1 = 144 - 1 = \mathbf{143}$
31. (D) C B C D I H I J
    –1 +1 +1 –1 +1 +1
    O N O P U T U W
    –1 +1 +1 –1 +1 +2
32. (B) Plastic is a non-metal whereas Iron, Bronze and Copper are either a metal or an alloy.
33. (D) 96 = 32 × 3; 24 = 8 × 3
    39 = 13 × 3; 18 = 6 × 3
    81 = 27 × 3; 54 = 18 × 3
    Here (82, 64) are not multiples of 3.
34. (A) We can find more than one vowel in rest of the options.
35. (D)
36. (B)
37. (D) 10 12 15 68 70 73
    +2 +3 +2 +3
38. (C) 8 + 16 = 24
    16 + 24 = 40

24 + 40 = $\boxed{62}$ ≠ 64
40 + 64 = 104
64 + 104 = 168

39. (B) 12 18 27 $\boxed{40\frac{1}{2}}$
$\times\frac{3}{2}$ $\times\frac{3}{2}$ $\times\frac{3}{2}$

40. (D) Required number = 51 – 21 + 1 = 31

41. (A)

M	I	C	R	O	W	A	V	E
–1	+1	–1	+1	–1	+1	–1	+1	–1
L	J	B	S	N	X	Z	W	D

P	O	P	U	L	A	R
–1	+1	–1	+1	–1	+1	–1
O	P	O	V	K	B	Q

42. (D) B = (2), MAT = 13 + 1 + 20 = 34
JOGLEX = 10 + 15 + 7 + 12 + 5 + 24 = **73**

43. (C) 2 5 10 $\boxed{17}$ 26
+3 +5 +7 +9

44. (A) 138 142 146 150 $\boxed{146}$ 142 138
+4 +4 +4 –4 –4 –4

45. (D) 5 × 2 × 6 = 60
8 × 4 × 2 = 64
7 × 6 × 3 = **126**

46. (D) 25 = 5 × 5
30 = 5 × 6
35 = ? × 5
$\therefore ? = \frac{35}{5}$ = **7**

47. (D) $[(4)^2 + (2)^2 + (5)^2 + (3)^2] \div 2 = 54 \div 2 = 27$
$[(5)^2 + (3)^2 + (2)^2 + (6)^2] \div 2 = 74 \div 2 = 37$
$[(5)^2 + (9)^2 + (2)^2 + (2)^2] \div 2 = 114 \div 2$ = **57**

48. (D) 8 – 8 + 1 = 11 ÷ 11
⇒ 0 + 1 = 1
⇒ 1 = 1

49. (A) As,

M	O	N	E	Y
↓	↓	↓	↓	↓
1	2	3	4	5

P	L	U	S
↓	↓	↓	↓
6	7	8	9

So,

P	L	U	M
↓	↓	↓	↓
6	7	8	1

50. (D)

Day before yesterday	Yesterday	Today	Tomorrow	Day after tomorrow
↓	↓	↓	↓	↓
Wednesday	Thursday	Friday	Saturday	Sunday

51. (B) The separation of powers, often imprecisely used interchangeably with the trias 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.

52. (B) The equatorial climate is found between 5 degree north and 10 degree south of the equator. Precipitation in the equatorial region is heavy between 60 inches and 106 inches and is well distributed throughout the year. Due to this abundant rainfall, tropical rainforest climate is usually found at latitudes within five degrees North and South of the equator.

53. (C) Economic liberalization is a very broad term that usually refers to fewer government regulations and restrictions in the economy in exchange for greater participation of private entities. The doctrine is associated with classical liberalism. The arguments for economic liberalization include greater efficiency and effectiveness that would translate to a "bigger pie" for everybody. Thus, liberalization in short refers to "the removal of controls", the encourage economic development.

54. (A) An important physical property of non-metals is that they are brittle and hence cannot be beaten into sheets or drawn into wires. In other words, non-metals are non-malleable and non-ductile. When stress is applied on non-metals, they shatter into pieces.

55. (C) The atmosphere of the Earth is an envelope of gases extending to a height of 200 kms.

56. (B) Jaundice is a yellow discoloration of the skin, mucous membranes, and the whites of the eyes caused by increased amounts of bilirubin in the blood. Normally, the liver metabolizes excretes the bilirubin in the form of bile. However, if there is a disruption in this normal metabolism and/or production of bilirubin, jaundice may result.

61. (A) Mercury causes bio-magnification problem in the ecosystem.

63. (C) The Kushan period is considered the Golden period of Gandhara. Peshawar Valley and Taxila are littered with ruins of stupas and monasteries of this period. Gandharan art flourished and it produced some of the best pieces of Indian sculpture. Many monuments were created to commemorate the Jataka tales. The Gandhara civilization peaked during the reign of the great Kushan King Kanishka (128-151). The cities of Taxila (Takshasila) at Sirsukh and Peshawar were built.

66. (D) **Composition of air**
Nitrogen : 78.08 percent
Oxygen : 20.94 percent
Argon : 0.93 percent
Carbon dioxdie : 0.03 percent
Neon : 0.0018 percent
Helium : 0.005 percent
Ozone : 0.00006 percent
Hydrogen : 0.00005 percent

68. (D) The Ninth Five Year Plan recognised the integral link between rapid economic growth and the quality of life of the mass of the people. Ensuring environmental sustainability of the development process through social mobilisation and participation of people at all level was one of the specific objectives of the Ninth Plan as approved by the National Development Council. In the Ninth Plan document, policies and programmes during the Eighth Plan period were reviewed, shortcomings identified and new policy framework suggested overcoming the shortcomings and ensuring sustainability of the development process not only in economic terms but also in terms of social and environmental factors.

70. (C) Article 280 of the Indian Constitution deals with the Finance Commission. The Finance Commission of India came into existence in 1951. It was established under Article 280 of the Indian Constitution by the President of India. It was formed to define the financial relations between the centre and the state.

71. (C) Raja Todar Mal was a warrior, an able administrator and an exemplary finance minister. He was one of the 'Navratnas' of Akbar's court. He introduced an excellent land revenue system. In 1582, the title Diwan-I-Ashraf was bestowed upon him by the Emperor.

72. (B) When magma solidifies under the earth's surface, it forms plutonic rock bodies or plutons. The most common rock types in plutons are granite, granodiorite, tonalite, monzonite, and quartz diorite.

76. (B) The Calcutta High Court is the oldest High Court in the country which was established on 2nd July, 1862. Madras High Court in Chennai, Bombay High Court in Mumbai, Calcutta High Court in Kolkata are the first three High Courts in India.

78. (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_2 scavenging and the provision of carbon assimilates.

80. (C) When a running car stops suddenly, the passengers tend to lean forward due to inertia of motion. Inertia is that property of a body due to which it resists a change in its state of rest or of uniform motion.

81. (B) Legal tender is a medium of payment allowed by law or recognized by a legal system to be valid for meeting a financial obligation. So it is accepted by people and government on a legal basis. Paper currency and coins are common forms of legal tender in many countries.

86. (D) Female birds in most families have only one functional ovary (the left one), connected to an oviduct-although two ovaries are present in the embryonic stage of each female bird.

88. (B) According to Newton's first law, an object that is at rest will stay at rest unless an external force acts upon it and an object that is in motion will not change its velocity unless an external force acts upon it. So this law is known as the law of inertia.

89. (C) The chemical used for cloud seeding for artificial rains is silver iodide.

90. (C) There are three bones in each human ear. The small ear bones are arranged in series and are known as ossicles. Ear bones are the malleus or hammer, the

incus or anvil and the stapes, or stirrup. Together they form a short chain that crosses the middle ear and transmits vibrations caused by sound waves from the eardrum membrane to the liquid of the inner ear. As we have a pair of ear, total number of bones are 6.

93. (D) Lucknow Pact, (December 1916) was a famous agreement made by the Indian National Congress headed by Maratha leader Bal Gangadhar Tilak and the All-India Muslim League led by Muhammad Ali Jinnah which was adopted by the Congress at its Lucknow session on December 29 and by the league on December 31, 1916. The meeting at Lucknow marked the reunion of the moderate and radical wings of the Congress. The pact dealt both with the structure of the government of India and with the relation of the Hindu and Muslim communities.

94. (A) Corporate Tax is a levy placed on the profit of a firm, with different rates used for different levels of profits. Corporate taxes are taxes against profits earned by businesses during a given taxable period. Most countries tax all corporations doing business in the country on income from that country.

96. (D) When treated with ammoniacal silver nitrate solution alkynes form white precipitate of silver acetylides.

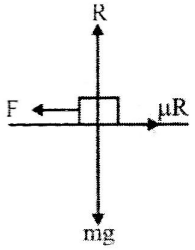
97. (C) The process is known as index definition. The order in which columns are listed in the index definition is important. A database index is a data structure that improves the speed of data retrieval operations on a database table at the cost of slower writes and increased storage space. Indices can be created using one or more columns of a database table, providing the basis for both rapid random lookups and efficient access of ordered records.

98. (A) Goa is a former Portuguese colony, the Portuguese overseas territory of Portuguese India existed for about 450 years until it was annexed by India in 1961. In 1510, the Portuguese defeated the ruling Bijapur kings with the help of a local ally, Timayya, leading to the establishment of a permanent settlement in Velha Goa (or Old Goa). In 1843 the capital was moved to Panjim from Velha Goa. By the mid of the 18th century the area under occupation had expanded to most of Goa's present day state limits. Simultaneously the Portuguese lost other possessions in India until their borders stabilized and formed the Estado-da-India Portuguesa, of which Goa was the largest territory.

99. (A) An ecosystem is a community of living and non-living things that work together. It includes soil, atmosphere, heat and light from the sun and also includes water and living organisms.

100. (B) Dadabhai Naoroji, of Bombay Parsee origin, is the "Grand Old Man of India" and the "Father of Indian Nationalism" who worked with perseverance and unshakeable faith towards the goal of Swaraj was the first Indian to claim self-government for his people. Dadabhai Naoroji was also the first Indian to show that India was being drained of its wealth under the British rule and thus was fast succumbing to poverty. He played a key role in founding the Indian National Congress in 1885 and was associated with the organisation till his death.

104.(B)



$R = mg = 35 \times 9.81$

$F = \mu R.$

$$\mu = \frac{F}{R}$$

$$\mu = \frac{30}{35 \times 9.81}$$

$$\mu = 0.087$$

107.(A) $$\tau_{max} = \frac{pd}{8t} = \frac{10 \times 200}{8 \times 5}$$

$$\tau_{max} = 50 N / mm^2$$

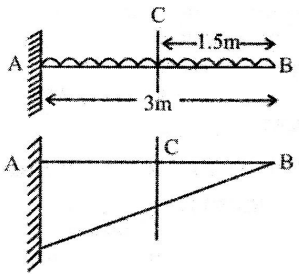
108.(C) $$\sigma_c = \sigma_l = \frac{pd}{4t}$$

$$\sigma_c = \frac{pd}{4t}$$

$$500 = \frac{25 \times 200}{4t}$$

t = 2.5cm

111.(C)



$(SF)_c$ = 6kN

$(SF)_c$ = w × 1.5

6 = w × 1.5

w = 4kN

112.(A) a^2

Area of circle $= \frac{\pi d^2}{4}$,

Moment of Inertia of square $= \frac{a^4}{12}$

Moment of Inertia of circle $= \frac{\pi d^4}{64}$

$$\frac{I_{sq}}{I_c} = \frac{a^4/12}{\pi d^4/64}$$

Area of square = Area of circle

$$a^2 = \frac{\pi d^2}{4}$$

Squaring of both side

$$\Rightarrow a^4 = \frac{\pi^2 d^4}{16}$$

$$\frac{I_S}{I_C} = \frac{a^4 \times 64}{12 \times \pi d^4}$$

$$\frac{I_S}{I_C} = \frac{\pi^2 d^4 \times 64}{16 \times 12 \times \pi d^4}$$

$$\frac{I_S}{I_C} = \frac{\pi}{3}$$

$$\frac{I_C}{I_S} = \frac{3}{\pi}$$

113.(C) d_0 = 10cm

d_i = 5cm

Section modulus = J/y

$$\frac{\pi(d_0^4 - d_1^4) \times 2}{32 \times d_0}$$

Section modulus = 184cm^3

114.(A) For the solid shaft, $\tau = \frac{16\,T}{\pi D^3}$

For the hollow shaft,

$$\tau = \frac{16\,T\,D}{\pi(D^4 - d^4)} = \frac{16T}{\pi D^3} \times \frac{1}{1-(d/D)^4}$$

$$= \frac{16\,T}{\pi D^3} \times \frac{1}{1-(1/2)^4}$$

$$= \frac{16}{15} \times \frac{16\,T}{\pi D^3} = 1.067\,\tau$$

121.(B) Number of instantaneous center

$$= \frac{N(N-1)}{2}$$

Number of instantaneous center = 10

$$10 = \frac{N(N-1)}{2}$$

$N^2 - N - 20 = 0$

(N+4) (N-5) = 0

N = 5

123.(D) I = 2500 kg-m^2

α = 0.6 rad/s^2

T = ?

$\tau = I\alpha$

τ = 2500 × 0.6

τ = 1500 N.m

125.(C) $h = \frac{(r_1 - r_2)y}{x}$

$$S = \frac{S_1 - S_2}{h}$$

131.(D) $P_c = \frac{\pi D}{T} = \pi m = \pi \times 4.25 = 13.357mm$

134.(C) P = $(T_1 - T_2)$V N-m/s

Tension in tight side = T_1

Testion in slack side = T_2

P = 22.5 kw 22.5 × 1000 Watt

V = 880m/min = $\frac{880}{60} m/s$

$$22.5 \times 1000 = (T_1 - T_2) \times \frac{880}{60}$$

$T_1 - T_2$ = 1536.80 $\simeq$ 1540

139.(B) Shearing strength (S) $\propto$ Area

Shearing strength (S) $\propto \frac{\pi}{4}d^2$

$S \propto d^2$

$\frac{S_1}{S_2} = \left(\frac{d_1}{d_2}\right)^2$

If $2d_1 = d_2$
$S_2 = 4S_1$
$S_2 = 4 \times 50$
$S_2 = 200N/mm^2$

142.(B) $p = \rho gh.$

$h = \frac{p}{\rho g} = \frac{1.006 \times 10^6 N/m^2}{1025 \times 9.81}$

h = 100m

145.(B) $P = \omega A\bar{x}$

$P = \rho g A\bar{x}$

$P = 1000 \times 10 \times 9 \times 1.5$

$P = 13500\,Kg$

ρ = density of liquid
$A = 3 \times 3 = 9m^2$

$\bar{x} = \frac{3}{2} = 1.5m$

160.(a) H = 405m
N = 400rpm
$K_n = 0.45$

$u = \frac{\pi DN}{60} and\, u = K_n\sqrt{2gH}$

$u = \frac{\pi D \times 400}{60} = 0.45\sqrt{2 \times 9.81 \times 405}$

$\frac{\pi D \times 400}{60} = 0.45\sqrt{2 \times 9.81 \times 405}$

D = 1.93m

162.(C) $Q = 0.013m^3/sec$
$H_m = 32m$
SP = 6 kw
$\rho = 1000\ kg/m^3$

$\eta_0 = \frac{WH}{1000 \times SP}, W = \rho gQ$

$\eta_0 = \frac{1000 \times 9.81 \times 0.013 \times 32}{1000 \times 6}$

$\eta_0 = 69\%$

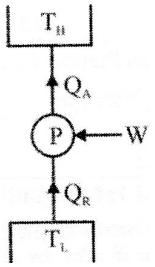
173.(B) $ds = \frac{dQ}{T}$

ds = KJ/kg $-^0$K
dQ = 2560KJ/Kg
T = 237 + 100 = 373

$ds = \frac{2560}{373} = 6.86 KJ/kg^0K$

$ds = 6.86 KJ/kg^0K$

181.(C)



$T_2 = -23 + 273 = 250K$
$T_1 = 27 + 273 = 300K$

C.O.P $= \frac{T_1}{T_1 - T_2} = \frac{300}{300 - 250} = \frac{300}{50}$

C.O.P. $= \frac{300}{50} = \underline{6}$

192.(C)

	Materials	**Shrinkage allowance**
1.	Gray CI	7-10.5 mm/meter
2.	White CI	21 mm/meter
3.	Malleable CI	15 mm/meter
4.	Steel	20 mm/meter
5	Brasss	14 mm/meter
6	Aluminium	18 mm/meter
7.	Aluminium Alloy	13-16 mm/meter

197.(D) Accroding to Ernst – Merchant theory

$\phi = \frac{\pi}{4} - \frac{\beta}{2} + \frac{\gamma}{2}$

$2\phi + \beta - \gamma = 90^o$

$\phi = 22.8^o$
$\gamma = 75^o$
$(2 \times 22.8) + \beta - 75^o = 90^o$
$\beta = 119.4^o$

198.(D) $C = VT^n$

n = 0.25 or $\frac{1}{4}$

$V_1 = V$

$V_2 = \frac{V}{2}$

$V_1 \times T_1^n = V_2 \times T_2^n$

$V_1 \times T_1^{0.25} = \frac{V}{2} T_2^{0.25}$

$T_2 = 16T_1$