

Answer-key & Solution

SSC JE (MECH)
Practice Set-14

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

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-14

1. (C)

A	B	C	D	E
225	256	121	289	324
↓	↓	↓	↓	↓
15 ²	16 ²	11 ²	17 ²	18 ²
↓	↓	↓	↓	↓
+1	+1	+1	+1	+1

2. (D) February month has 28 or 29 days.

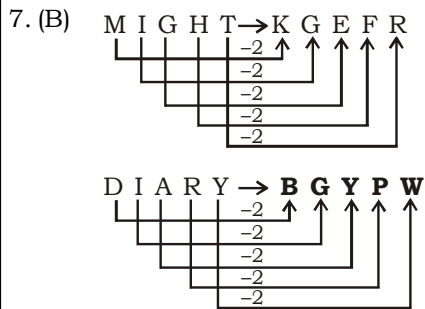
3. (D) Cost price of 1 kg wheat = $\frac{384}{16}$
 = ₹ 24/kg
 ∴ Cost price of 90 kg wheat = 24×90
 = ₹ 2160

4. (A) The value after exchange

3	6	5	4	1	9
↓	↓	↓	↓	↓	↓
9	2	8	1	4	3

5. (B) STENT

6. (B) 3 (2) (9) → GOD (is) (LOVE)
 (9) (2) 7 → (LOVE) (is) BEAUTIFUL



8. (B) $(4 \times 36) \div 12 = 12$
 $(13 \times 13) \div 13 = 13$
 $(8 \times 32) \div 16 = 16$

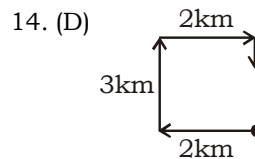
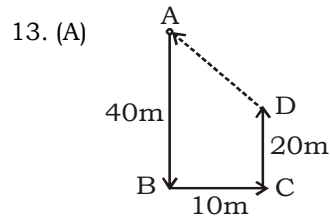
9. (C) $5 \times 4 \times 8 = 160$
 $7 \times 8 \times 6 = 336$
 Similarly,
 $9 \times 2 \times x = 108$
 $18x = 108$
 $x = 108 \div 18 = 6$

10. (C) $6 + 5 + 7 + 3 = 21$
 $7 + 3 + 8 + 3 = 21$
 $4 + 5 + 6 + 6 = 21$

11. (A) $5 \times 3 \div 3 - 5 = 0$
 $5 \times 1 - 5 = 0$
 $5 - 5 = 0$

12. (D) $70 \times 7 - 113 + 13 = 390$
 $= 490 - 113 + 13 = 390$
 $= 490 + 13 - 113 = 390$

$= 503 - 113 = 390$
 $= 390 = 390$



15. (A)

16. (C) Cataract : Eye :: Pneumonia : **Lungs**
 Affected part ↑ Affected part ↑

17. (B) 18. (C)

19. (D) T T T : 7 7 7 :: R R R : 9 9 9
 Reverse of the English Alphabet ↑ Reverse of the English Alphabet ↑

20. (A) C : I :: D : L
 ↓ ↓ ↓ ↓
 3 9 4 12
 (3×4)-3 ↑ (4×4)-4 ↑

21. (D) YAD : NUS :: **THGIN** : NOOM
 ↓ ↓
 SUNDAY :: MOONNIGHT

22. (B) 27 : 3 :: 873 : **97**
 ↑ ↑
 +9 +9

23. (D) 6 : 34 :: 9 : **79**
 ↑ ↑
 6²-2 9²-2

24. (B) $352 \Rightarrow 3 \times 5 \times 2 = 30$
 $296 \Rightarrow 2 \times 9 \times 6 = 108$
 $628 \Rightarrow 6 \times 2 \times 8 = 96$

25. (D)

26. (C)

27. (A)

28. (A) Except option (A) all are perfect cubes.

29. (D) (A) 1876

$\Rightarrow 1 + 8 + 7 + 6 = 22$ (Even Number)

(B) 1984

$\Rightarrow 1 + 9 + 8 + 4 = 22$ (Even Number)

(C) 2024

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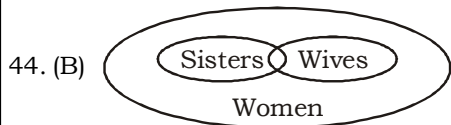
- $\Rightarrow 2 + 0 \ 2 + 4 = 8$ (Even Number)
(D) 2014
 $\Rightarrow 2 + 0 + 1 + 4 = 7$ (odd Number)
30. (D) (A) **3 — 9** (B) **5 — 25**
 $\begin{array}{|c|} \hline \text{Square and} \\ \text{odd number} \\ \hline \end{array}$ $\begin{array}{|c|} \hline \text{Square and} \\ \text{odd number} \\ \hline \end{array}$
- (C) **7 — 49** (D) **8 — 64**
 $\begin{array}{|c|} \hline \text{Square and} \\ \text{odd number} \\ \hline \end{array}$ $\begin{array}{|c|} \hline \text{Square and} \\ \text{even number} \\ \hline \end{array}$
31. (C) (A) **O H A** (B) **P I B**
 $\begin{array}{|c|} \hline -7 \uparrow -7 \uparrow \\ \hline \end{array}$ $\begin{array}{|c|} \hline -7 \uparrow -7 \uparrow \\ \hline \end{array}$
- (C) **J Q C** (D) **R K D**
 $\begin{array}{|c|} \hline +7 \uparrow -14 \uparrow \\ \hline \end{array}$ $\begin{array}{|c|} \hline -7 \uparrow -7 \uparrow \\ \hline \end{array}$
32. (D) (A) **D H F** (B) **K O M**
 $\begin{array}{|c|} \hline +4 \uparrow -2 \uparrow \\ \hline \end{array}$ $\begin{array}{|c|} \hline +4 \uparrow -2 \uparrow \\ \hline \end{array}$
- (C) **R V T** (D) **W Y X**
 $\begin{array}{|c|} \hline +4 \uparrow -2 \uparrow \\ \hline \end{array}$ $\begin{array}{|c|} \hline +2 \uparrow -1 \uparrow \\ \hline \end{array}$
33. (C) (A) **B D F H**
 $\begin{array}{|c|} \hline +2 \uparrow +2 \uparrow +2 \uparrow \\ \hline \end{array}$
- (B) **J L N P**
 $\begin{array}{|c|} \hline +2 \uparrow +2 \uparrow +2 \uparrow \\ \hline \end{array}$
- (C) **Y O I C**
 $\begin{array}{|c|} \hline -10 \uparrow -6 \uparrow -6 \uparrow \\ \hline \end{array}$
- (D) **R T V X**
 $\begin{array}{|c|} \hline +2 \uparrow +2 \uparrow +2 \uparrow \\ \hline \end{array}$
34. (B)

Foundation	Floor	Window	Ventilator
2	3	1	4
Roof			
5			
35. (A)

LEADEN	LEAF	LEAK	LEARNED
5	1	4	2
LEAVED			
3			
36. (A)

Fan	Feast	Fish	Flesh	Fraud
2	4	1	3	5
37. (B)

	+0		+0					
A	D	G	G	J	M	M	P	S
+3	+3	+3	+3	+3	+3	+3	+3	
38. (C) **A C F K R**
 $\begin{array}{|c|} \hline +2 \uparrow +3 \uparrow +5 \uparrow +7 \uparrow \\ \hline \end{array}$
39. (B) **K H E, B Y V, S P M**
 $\begin{array}{|c|} \hline -3 \uparrow -3 \uparrow -3 \uparrow -3 \uparrow -3 \uparrow \\ \hline \end{array}$
40. (C) **25 35 55 85 125**
 $\begin{array}{|c|} \hline +10 \uparrow +10 \uparrow +10 \uparrow +10 \uparrow \\ \hline \end{array}$
41. (D) 42. (C)
43. (B)



45. (A)
 A large oval labeled "Pulses" contains two smaller overlapping ovals labeled "Red gram" and "Moong dal".
46. (C) 47. (A)
48. (D) 49. (D)
50. (D) B \rightarrow 01, **11**, 21, 34, 43
 L \rightarrow 06, 50, **66**, 75, 88
 A \rightarrow 00, **12**, 21, 34, 43
 C \rightarrow 02, 14, **20**, 33, 42
 K \rightarrow 05, **57**, 67, 77, 80
104. (B) $W = 50 \text{ kW}$, $Q = \frac{3 \times 75000}{3600} = 62.5 \text{ kW}$
 $W \neq Q$, first law of thermodynamics is violated
 $T_1 = 627 + 273 = 900 \text{ K}$, $T_2 = 27 + 273 = 300 \text{ K}$
- $$\eta_{\text{Carnot}} = 1 - \frac{T_2}{T_1} = 1 - \frac{300}{900} = 0.67$$
- $$\eta_{\text{H.E}} = \frac{W}{Q} = \frac{50}{62.5} = 0.8$$
- $\eta_{\text{H.E}} > \eta_{\text{Carnot}}$, which is not possible
 Therefore, second law of thermodynamics is also violated.
 Cost of fuel per hour = $3 \times 30 = \text{Rs. } 90$
 Value of power = $5 \times 50 = \text{Rs. } 250$
 The performance of this engine is not possible.
107. (D) $dQ = du + dW$
 since $du = 0$
 $\therefore dQ = dW = 300 \text{ kN-m}$
108. (C) $\delta W - \delta Q = 0$
 This is the first law for a closed system undergoing a cycle.
109. (D) Since free expansion occurs against vacuum hence no work is done by the expanding fluid.
110. (A) $W = \frac{1}{4} Q_{\text{rej}}$
 $Q_{\text{add}} - Q_{\text{rej}} = \frac{1}{4} Q_{\text{rej}}$
 $Q_{\text{add}} = \left(1 + \frac{1}{4}\right) Q_{\text{rej}} = \frac{5}{4} Q_{\text{rej}}$
 $\eta = 1 - \frac{Q_{\text{rej}}}{Q_{\text{add}}} = 1 - \frac{4}{5} = 20\%$
119. (B) Entropy constant \square vertical line
 Temperature constant \square Horizontal line.

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12020(C) Works is high grade energy feed is low grade energy.

1303(B) Neutral flame as zones

(i) inner zone (ii) outer zone

14343(D) Guide vanes are the vanes which are attached to the casing and guide the water to the turbine in the runner.

1515(D) $P = \frac{\rho v^3 A}{4}$

$P = \frac{15050}{252540} = 0.55 \text{ kN/cm}^2$

15252(C) Life $\propto \left(\frac{1}{P}\right)^3$

$\Rightarrow L_2 = L_1 \left(\frac{P_1}{P_2}\right)^3 = \left(\frac{1010}{2020}\right)^3 = 10000 \text{ hrs.}$

15353(D) Life of bearing in millions of revolution = 200060606000

L = 727 millions of Revolution

Radial load capacity 222 kN

For Ball bearing

$L = \left(\frac{C}{P}\right)^3 \Rightarrow 727 = \left(\frac{222}{P}\right)^3$

$P = 5.28 \text{ kN}$

15555(D) $P = \frac{4\sigma d^3 \times \pi \times 0.7073}{d \times 1 \times 10^{-3}}$

$P = 0.29292 \times 10^3 = 292.92 \text{ N/m}^2$

1565(B) $E = 200 \text{ GPa}$

$12020 = 25050$

$\sigma = 0.2$

1575(B) For isotropic material, Poisson's ratio is 0.25. However, more recent calculations based upon a model of atomic structure give 0.35.

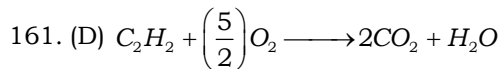
1585(C) In spherical vessel the circumferential stress and longitudinal stress is equal and less than circumferential stress of cylinder vessel.

$\sigma_h = \frac{p d p d}{4 t}$

1595(B) $\sigma = \frac{p d p d}{2 t}$

$t \geq \frac{p d p d}{2 \sigma}$ $\therefore (d \text{ is diameter})$

$t \geq \frac{10000 p d}{2 \sigma}$



163. (B) Tangential force

Cutting power is used to calculate the total power consumption in machining

$P_c = F_c \times V$

where'

$P_c \rightarrow$ Cutting power

$F_c \rightarrow$ cutting force or tangential force;

$V \rightarrow$ cutting velocity.

165. (A) Ratchet and pawl mechanism \rightarrow Feed motion in shape gearing

Rack and pinion mechanism \rightarrow feed motion in drilling

Whitworth mechanism \rightarrow quick return motion in pinion

167. (C) For proper functioning of riser, its metal should solidify after solidification of metal in the mould cavity, therefore, freezing ratio must be greater than unity.

169. (C) Solidification of gray cast iron occurs in two stages. The shrinkage associated with first stage may well be compensated by expansion during second stage. This is due to graphitization.

172. (D) $A_1 V_1 = A_2 V_2$

$V_2 = \frac{A_1}{A_2} V_1$

$V_2 = \frac{36}{144} V_1 = \frac{V_1}{4}$

we get

$h_e = \frac{1}{2g} \left(V_1 - \frac{V_1}{4} \right) = \frac{9}{16} \frac{V_1^2}{2g}$

174. (D) Venturimeter is known as rate meter. It is a device used for finding out the discharge.

175. (C) For velocity potential function to exist the flow must be irrotational since the continuity equation has to be satisfied.

176. (B) The ability of metal to be formed by hammering or rolling is called malleability

179. (A) Mild steel, cast iron and galvanized steel cannot used as a cutting tool material. While high speed steel is a cutting tool material having high hot hardness as compared to high carbon

steel. Limiting cutting speed of HSS is 28 to 30 m/min and limiting cutting temperature is 650°C

186. (D) Hobbing process of gear manufacturing is a very fast process of gear manufacturing hence high production rate can be achieved, with the help of hobbing process helical gears, bevel gears, spur gear etc. can be produced very accurately but internal teeth can not be cut.

187. (C) Cope and drag are two parts of the casting mold. Upper part is called cope and lower part is called drag.

188. (B) Fluidity can be defined as the length of spiral covered by the molten metal before it get solidifies. Fluidity is the function of temperature, higher the temperature, more will be the fluidity.

189. (B) D.C. reverse polarity
Work piece \Rightarrow Negative
Electrode \Rightarrow Positive

190. (D) In electron beam welding, vacuum is required in order to conserve the kinetic energy of electron beam before hitting the workpiece.

194. (A) $E = 2G(1 + \mu)$
 $125 = 2G(1 + 0.25)$
 $G = 50 \text{ GPa}$