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2007, OUTRAM LINES, 1ST FLOOR, OPPOSITE MUKHERJEE NAGAR POLICE STATION, DELHI-110009

Answer-key & Solution

SSC JE (Electrical)
MOCK - (133)
Date:- 10.2.2018

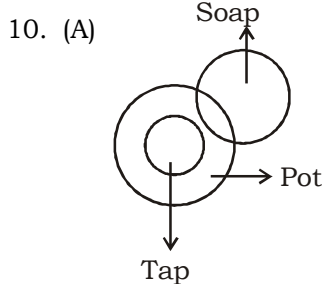
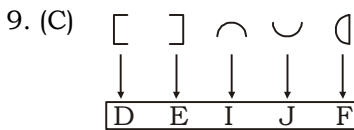
1. C	26 A	51 D	76 D	101. A	126. B	151. B	176. C
2. D	27 B	52 B	77 B	102. C	127. C	152. A	177. C
3. A	28 D	53 C	78 D	103. B	128. B	153. C	178. C
4. A	29 B	54 A	79 A	104. C	129. C	154. A	179. B
5. B	30 C	55 A	80 A	105. D	130. B	155. C	180. B
6. B	31 D	56 C	81 B	106. A	131. D	156. B	181. B
7. C	32 C	57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

Note : If your opinion differ regarding any answer, please message the mock test and Question number to 9821756838

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

SOLUTION SSC JE (Electrical) MOCK TEST no. 133

1. (C) Y mail is related to Yahoo and Gmail is related to **Google**.
2. (D) 14th November is Children's day and **14th February** is Valentine day.
3. (A) $18(1 + 8) = 162$, $26(2 + 6) = 208$
4. (A) Akbar was mughal emperor and Ashok was **mauryan** emperor.
5. (B) '**June**' month is of 30 days.
6. (B) X = 10, **II = 2**, C = 100, XXII = 22
Only '2' is the prime number.
7. (C) Except **Tally**, others are related to MS office suite.
8. (A) Sofa, Table and Chair are **furnitures**.



1. False 2. False

11. (B)
$$\begin{array}{r} 6\ 2\ 5\ 3 \\ +\ 1\ 8\ 7\ 8 \\ \hline 8\ 1\ 3\ 1 \end{array}$$

12. (B) $3 + 5 + 7 + 8 = 23$
 $2 + 3 = 5$

13. (B) HCF (12, 15) = 3
HCF (15, 20) = 5
HCF (20, 24) = 4
HCF (24, 26) = 2
HCF (26, 39) = 13
HCF (39, 12) = 3

14. (B)
15. (C)

16. (C)
$$\begin{array}{cccccc} 7.2 & 36 & 144 & 432 & 864 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ \times 5 & \times 4 & \times 3 & \times 2 & \end{array}$$

17. (D)
$$\begin{array}{cccccc} 16 & 3 & 0.5 & -2.5 & -9 & -41 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ \times 0.25-1 & \times 0.5-1 & \times 1-3 & \times 2-4 & \times 4-5 & \end{array}$$

18.

(A)
$$\begin{array}{cccccccc} 484 & 289 & 529 & 256 & 576 & 225 & 625 & 196 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 22^2 & 17^2 & 23^2 & 16^2 & 24^2 & 15^2 & 25^2 & 14^2 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ +1 & -1 & +1 & -1 & +1 & -1 & \end{array}$$

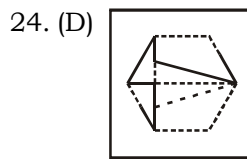
19. (B) 1 = ONE = 3 letters
3 = THREE = 5 letters
6 = SIX = 3 letters
11 = ELEVEN = 6 letters
then, 13 = Thirteen = **8 letters**.

20. (A) $\underline{abcd}/\underline{adbc}/\underline{acdb}/\underline{abcd}$

21. (D) $24 \times 5 - 318 \div 6 + 3$
 $= 24 \times 5 - 53 + 3$
 $= 123 - 53$
 $= 70$

22. (C)

23. (C) $12 + 8 \div 4 - 6 \times 1$
 $= 12 + 2 - 6$
 $= 8$



25. (D) 22, 55, 31, 65
C O R E

26. (A) $\sqrt{36} = 6 \Rightarrow 6 \times (6 - 1) = 30$
 $\sqrt{49} = 7 \Rightarrow 7 \times (7 - 1) = 42$

27. (B) Kangaroo is the national animal of Australia and **Tiger** is the national animal of Bangladesh.

28. (D) $20 : \frac{20}{2} + 1 :: 84 : \frac{84}{2} + 1$

So, **43** is the answer.

29. (B)

30. (C) Except option (C), In other options the positions of each letter is increased by 1.

31. (D) Except **Madurai**, others are hill-stations.

32. (C) $128 \Rightarrow 1 + 2 + 8 = 11 \Rightarrow 1 + 1 = 2$
 $786 \Rightarrow 7 + 8 + 6 = 21 \Rightarrow 2 + 1 = 3$

$513 \Rightarrow 5 + 1 + 3 = 9 \neq 6$

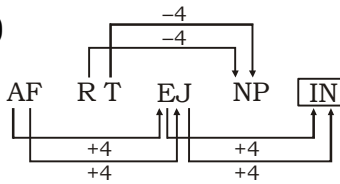
$719 \Rightarrow 7 + 1 + 9 = 17 \Rightarrow 1 + 7 = 8$

33. (B) Second number divides the first number completely.

34. (A) My father's mother is my Grandmother and her husband is **Grandfather** of me and my siblings.

35. (B) 'Moon is a source of light' - The statement doesn't mean that moon is not a source of light and also doesn't mean that light has only one source. So, **neither conclusion I nor II follows**.

36. (D)



37. (B) $5 \times 2 \times 8 = 80$

$$8 \times 4 \times 3 = 96$$

$$7 \times 6 \times 5 = \mathbf{210}$$

38. (B) $5^3 + 8^2 = 125 + 64 = 189$

$$4^3 + 2^2 = 64 + 4 = 68$$

$$5^3 + 3^2 = 125 + 9 = \mathbf{134}$$

40. (C) C H U R C H

3 2 4 1 6 5

41. (B) The letter 'R' of POSTER is missing in word DECOMPOSITION.

42. (C) $Y \xrightarrow{-6} S \xrightarrow{-6} M \xrightarrow{-6} \mathbf{G}$

$W \xrightarrow{-6} Q \xrightarrow{-6} K \xrightarrow{-6} \mathbf{E}$

$V \xrightarrow{-6} P \xrightarrow{-6} J \xrightarrow{-6} \mathbf{D}$

43. (D) abc/ cba/ abc/ cba

44. (A) $A = 1 \Rightarrow 1^3 + 1^2 + 1 = 3$

$$B = 2 \Rightarrow 2^3 + 2^2 + 2 = 14$$

$$C = 3 \Rightarrow 3^3 + 3^2 + 3 = 39$$

$$D = 4 \Rightarrow 4^3 + 4^2 + 4 = 84$$

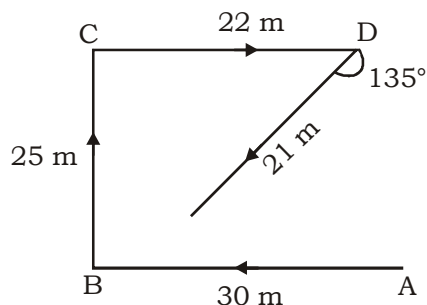
$$\therefore E = 5 \Rightarrow 5^3 + 5^2 + 5 = \mathbf{155}$$

45. (C) In option (C), after changing the signs we have,

$$3 + 6 - 1 = 16 \times 2 \div 4$$

$$\Rightarrow 8 = 8$$

46. (A)



So, Chahat is going in the **South-West** direction.

47. (D) number of triangles. = $\frac{4 \times 5}{2} = \mathbf{10}$

48. (B)

49. (D) There will be 5 dots opposite to 2 dots.

51. (D) The Servants of India Society was formed in Pune, Maharashtra, on June 12, 1905 by Gopal Krishna Gokhale. All are related to this organization.

52. (B) Due to the monsoon drift of Indian Ocean, regular direction of the ocean currents changes twice a year.

53. (C) Representation of states in the Parliament does require a constitutional amendment only with the ratification of the legislature of not less than one-half of the

states. Other given options require the same.

55. (A) As monkey and bullet both fall under the same gravitational force, so bullet will hit exactly the same point it has been aimed.

56. (C) Scintillation counter (scintillometer) : An instrument which measures gamma radiation. It is also used in airborne and ground radiometre surveys. This instrument utilizes the flash of light emitted when the atoms of a suitable 'phosphor' are energized by gamma rays. The scintillations are detected by a light-sensitive cathode.

57. (C) A terrestrial ecosystem is an ecosystem found only on landforms. Six primary terrestrial ecosystems which exist are tundra, taiga, temperate deciduous forest, tropical rain forest, grassland and desert.

59. (C) M P Veerendra Kumar, the noted Malayalam author and journalist, has been recently bestowed with the 30th edition of Moortidevi award 2016 by Bharatiya Jnanpith organization for his Malayalam travelogue "Hymavathabhoovil", which dwells upon ancient trails of Indian culture, myth, literature and people strewn in the plains, valleys and mountains of India. Kumar is Chairman and Managing Director (CMD) of the Malayalam daily Mathrubhumi and a Rajya Sabha MP.

60. (A) Mobile manufacturer OPPO Mobiles India Pvt Ltd has become the new team sponsor for the Indian cricket team for 5 years. The company in association with the Board of Control for Cricket in India (BCCI) will start from April 2017 for a period of five years. The team sponsor gets to have its commercial logo on the both the men's and women's kits. Oppo will replace broadcasting giants Star India, whose tenure will expire in March 2017.

61. (A) A famine had struck the district and a large part of Gujarat, and virtually destroyed the agrarian economy. The poor peasants had barely enough to feed themselves, but the British government of the Bombay Presidency insisted that the farmers not only pay full taxes, but also pay the 23% increase stated to take effect that year.

62. (D) Volcanic Mountain. Mount St. Helens, located in Washington State, is the most active volcano in the Cascade Range, and it is the most likely of the contiguous U.S. volcanoes. The volcano is almost 53 km due west of Mount Adams and approximately 80

- km northeast of the Vancouver, Washington-Portland, Oregon metropolitan area. Volcanism occurs at Mount St. Helens and other volcanoes in the Cascades are due to subduction of the Juan de Fuca plate off the western coast of North America.
63. (D) In Gujarat and Maharashtra the Chief Ministers come under the ambit of Lok Ayukta Act. Maharashtra was the first state to introduce the institution of Lokayukta through The Lokayukta and Upa-Lokayuktas Act in 1971. This was followed by similar acts being enacted by states of Odisha, Rajasthan, Bihar, Uttar Pradesh, Karnataka, Madhya Pradesh, Andhra Pradesh, Gujarat, Kerala and Delhi. The latest Lokayukta was established in Goa.
65. (B) Capillary action, or capillarity, is a phenomenon where liquid spontaneously rises in a narrow space such as a thin tube, or in porous materials such as paper or in some non-porous materials such as liquified carbon fibre. This effect can cause liquids to flow against the force of gravity or the magnetic field induction, in blotting of ink, spread of water drop on a cotton cloth and the rising of water from the roots of a plant to its foliage.
66. (C) Uranium oxide is smuggled across border in the form of yellow cake. Uranium oxide is produced by refining tons of dirt (ore) containing uranium to produce "Yellow cake". Typically yellow cake which contains 80% of uranium oxide, melts at approximately 2878°C whereas modern yellow cake contains 70 to 90% triuranium octoxide (U_3O_8) by weight. Yellow cake is used in the preparation of uranium fuel for nuclear reactor. Uranium obtained from yellow cake is also used in making many types of illegal nuclear explosive which are very dangerous to mankind.
67. (A) Eutrophication is the ecosystem response to the addition of artificial or natural substances, such as nitrates and phosphates, through fertilizers or sewage, to an aquatic system. One of its example is the "bloom".
68. (B) HDFC Bank has recently launched India's first Artificial Intelligence (AI)-based banking chatbot "Electronic Virtual Assistant (EVA)" for customer service. EVA can answer millions of customer queries across multiple channels instantly. Eva can assimilate knowledge from thousands of sources and provide answers in simple language in less than 0.4 seconds.
69. (B) Charles Wilkins was a member of Asiatic Society of Bengal founded by William Jones. He translated Bhagavad Gita into English in 1794.
71. (C) According to Article 131, The SC has original jurisdiction in any dispute –
- Between the Government of India & one or more States.
 - Between the Government of India and any State or States on one side and one or more other States on the other.
 - Between two or more States.
74. (B) The ABO blood group system is widely credited to have been discovered by the Austrian scientist Karl Landsteiner, who found three different blood types in 1900; he was awarded the Nobel Prize in Physiology or Medicine in 1930 for his work.
75. (D) Prime Minister Narendra Modi has recently inaugurated the India's longest cable-bridge over the Narmada River on the Ahmedabad-Mumbai section of NH-8 (New NH-48) in Bharuch, Gujarat. The bridge is built by Larsen and Turbo, as a part of the Rs. 379 crore project of the National Highway Authority of India (NHAI).
76. (D) These are seedless fruits that are formed without fertilization, e.g., Banana. Nowadays many seedless grapes, oranges and water melons are developed by horticulturists. Pomology is a branch of horticulture that deals with the study of fruits and their cultivation.
77. (B) The United Kingdom (UK) will host the 25th edition of Commonwealth Heads of Government Meeting (CHOGM) in April 2018 after a gap of over 20 years. The Commonwealth Summit is held in every two years and the position of Commonwealth Chair-in-Office will be transferred at the 2018 summit from the Prime Minister of Malta to the Prime Minister of the United Kingdom who will hold the post until the 26th CHOGM expected in 2020.
78. (D) Tenth schedule was added by the 52nd Constitutional Amendment Act, 1985. It provides for anti-defection law.
79. (A) Value of a commodity expressed in terms of money is called price. In modern times, goods are exchanged for money. The value of a commodity is its price.
80. (A) Indian Remote Sensing (IRS) satellites are used in Assessment of crop productivity,

Locating groundwater resources and Mineral exploration. This system was launched in 1979 and 1981. This system is used in agriculture, water resources, forestry and ecology, geology, marine fisheries and coastal management. It is the largest constellation of the remote sensing satellites.

81. (B) Nuclear fission is a perfect example of chain reaction. In case of nuclear fission a heavy atomic nucleus (such as that of uranium) disintegrates into two nearby equal fragments with release of large amount of energy when large number of nuclei is brought close together. In such a case the neutrons released, when one nucleus splits, strikes other nuclei causing them to split and the process continues. Now atomic bomb and nuclear reactor both work on nuclear fission chain reaction but chain reaction in nuclear reactor is controlled by control rods, made up of metal cadmium or boron a neutron absorbing material, whereas in atomic bomb there is no neutron absorber. So chain reaction goes uncontrolled and is very violent.
82. (A) Devadasi is a girl dedicated to worship and service of a deity or a temple for the rest of her life. They were considered the human wife of Lord Jagannath.
83. (A) The book "Aurangzeb: The Man and the Myth" has been authored by historian Audrey Truschke that retells the complex and contested life of the sixth Mughal emperor "Aurangzeb". It is a fascinating biography of an emperor who continues to dominate the contemporary discourse on the Hindu-Muslim relationship and beyond. The book addresses Aurangzeb's concern at the time of his death that he came as a stranger and would leave as a stranger. The novel is an example of how historical biographies of complex characters can be written.
84. (D) Great Nicobar, Sundarbans and Nanda Devi are biosphere reserves declared by Govt. of India. Gulf of Kutch is not a biosphere reserve, dry sandy plain.
86. (A) The Kori Bustard or paauw (*Ardeotis kori*) of northeast and southern Africa and the great bustard (*Otis tarda*) of Europe and Asia weigh about 40-42 pounds. There is a report of a 46 lb. 4 oz. male great bustard shot in north-eastern China. It is too heavy to fly.
87. (C) The Arunachal Pradesh government has launched a new scheme "Adarsh Gram Yojana" for rural poor. The purpose of the
- scheme is to reach the poor people in rural areas of the state to serve them better. Under the scheme, 123 villages (comprising one village per circle) will be developed as 'Model Villages' during the fiscal year 2017-18. The state government has allocated an amount of Rs.93 crore in the Budget 2017-18 for infrastructure development and for creating employment opportunities and community assets for the people of those villages.
88. (D) As of 2014, countries that have a one-party system include the three communist states of North Korea, China and Korea, as well as Iraq. In the 20th century, one of the most prominent examples of a state with a one-party system was the Soviet Union. In a single-party state, the local constitution is commonly worded to ban the transfer of a power from the ruling party to another party by limiting either legal existence or participatory ability in elections and decision-making.
- Two-party system: A two-party system is a party system where two major political parties dominate the government. One of the two parties typically holds a majority in the legislature and is usually referred to as the majority or governing party while the other is the minority or opposition party. For example, in the United States, Jamaica, and India.
 - Multi-party system: A multi-party system is a system in which multiple political parties across the political spectrum run for national election, and all have the capacity to gain control of government offices, separately or in coalition. For example Argentina, Austria, Brazil, Denmark, Finland, France, Germany, Iceland, Tunisia and Ukraine.
89. (A) Selling cost is an element of Monopolistic Competition. Monopolistic Competition is a market structure in which many firms sell products that are similar but not identical.
91. (C) Except hydrogen, all the rest three options diesel, coal and kerosene are either naturally occurring fossil fuels or derived from them. Thus as we know naturally occurring fossil fuels and their products have high percentage of carbon which on combustion lead to discharge of oxides by carbon (CO₂ & CO) in air. This results in to heavy environmental pollution like CO₂

- results in green house effect causing global warming While CO combines with haemoglobin of blood to form carboxyhaemoglobin causing death. Hydrogen fuel as such causes no pollution because on combustion with oxygen it forms water that's why it is also called future fuel.
92. (B) Battle of Wandiwash in 1960 and French were finally defeated by English. Battle of Buxar (1764) - English under Munro defeated Mir Qasim, Shuja-uddaula and Shah Alam-II.
93. (C) Sun is the star nearest to the earth. It is 150 million kilometres away from the earth. Sun has temperatures of over 15 million °C. The Sun's nearest neighbour, Alpha Centauri, is actually a triple-star system — three stars bound together by gravity.
94. (A) The hands in a human body have the most number of bones. Each hand has 27 bones. These bones are connected with muscles and tendons. Hand bones are also called as metacarpus and bones in the fingers are called as phalanges. fingers has three phalanges and thumb has two. There are 206 bones in a human body. Out of these 206 bones, 106 are in the hands and feet. Each Foot has 26 bones.
95. (C) Arun Jaitley, who is the current Finance Minister and Minister of Corporate Affairs in the Cabinet of India, has taken additional charge of the Union Ministry of Defence (MoD) on March 14, 2017. He succeeded Manohar Parrikar, who resigned from the post to take on the new role of Chief Minister of Goa. This is the 2nd time that Jaitley is holding the additional portfolio of Defence Ministry during the present NDA government. He was in-charge of the ministry earlier from 26th May to 9th November in 2014.
96. (C) According to 73rd Amendment Act, three-tier system of Panchayats exists: Village level, District Panchayat at the district level, the intermediate Panchayat which stands between the village and District Panchayats in the States where the population is above 20 Lakhs.
98. (B) Allicin is an oily, yellow liquid, which gives garlic its characteristic odour which is due to the -SO group. It also has a range of medical properties.
99. (A) Pitt's India act - 1784;
Indian Arms Act - 1878;
Ilbert Bill - 1883 - 84;
100. (B) Russia is the largest producer of fuel wood in the world because Russia has the largest cover of forests.
101. (A) by super position theorem
When only voltage source is acting
 $I = 2 \text{ A}$
When only current source is acting
 $I = -2\text{A}$ (in opporite direction)
So total current in 4Ω is = 0A
108. (C) $P_i = 150\text{W}$
 $P_c = 250\text{W}$
for maximum efficiency copper loss should be equal to the iron loss
So
 $P_c = P_i$
 $P_c = 150\text{W}$
Total loss = $P_i + P_c$
 $= 150 + 150$
 $= 300\text{W}$
111. (D) $R_{eq} = \frac{3 \times 6}{9} + 1$
 $R_{eq} = 3\Omega$
 $V = R_{eq} I_s = 3 \times 2 = 6\text{V}$
114. (C) $P_i = x^2 P_c$
 $P_i = \left(\frac{3}{4}\right)^2 P_c$
 $P_i = \frac{9}{16} P_c$
 $P_c = \frac{16}{9} P_i$
121. (D) $I = 1\text{A}$ for $I_s = 0$ Then $V = 2\text{V}$
 $I = ?$ for $I_s = 2\text{A}$ then $V = 2\text{V}$ remains constant by superposion theorem
When only current source I_s is acting
So $I = 1 \text{ A}$
and when only voltage source ($v = 2\text{V}$) is acting
 $I = 1\text{A}$ (in the same direction)
So total $I = 2\text{A}$
123. (C) $R \propto \frac{l}{A}$
 $l_2 = n l_1$

$$A_2 = A_1/n$$

$$R_2 = \frac{l_2 A_1}{l_1 A_2} R_1$$

$$= \frac{n l_1 A_1}{l_1 A_1 / n}$$

$$R_2 = n^2 R_1$$

127.(C) $\frac{V_a}{1} + \frac{V_a - 3}{2} = 6$

$$2V_a + V_a - 3 = 12$$

$$3V_a = 15$$

$$V_a = 5V \quad \dots(i)$$

$$I = \frac{V_a - 3}{2} = \frac{5 - 3}{2} = 1A$$

130.(B) $R_{th} = \left(\frac{7 \times 5}{12}\right) + \left(\frac{9 \times 6}{15}\right)$

$$= \frac{35}{12} + \frac{18}{5}$$

$$= 2.92 + 3.6$$

$$= 6.52\Omega$$

133.(A) $V_{th} = 20V$

$$I_{th} = -4A$$

$$R_{th} = 5\Omega$$

$$P = I^2 R_{th}$$

$$= 16 \times 5$$

$$P = 80W$$

137.(B) $24 - I + 2V_b - V_b - 4I = 0$

$$V_b = 3I$$

$$24 - I + 6I - 3I - 4I = 0$$

$$= 24 - 2I = 0$$

$$2I = 24$$

$$I = 12A$$

140.(C) $I_R = i + \alpha i$

$$V_2 = I_R R$$

$$V_1 = iR + V_2$$

$$V_1 = iR + iR + \alpha iR$$

$$= 2iR + \alpha iR$$

$$V_1 = iR(\alpha + 2) \quad \dots(i)$$

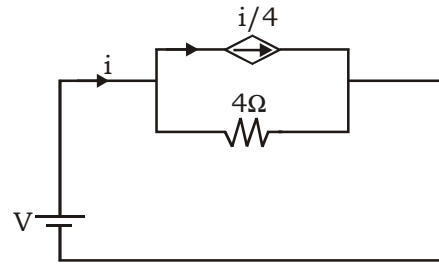
$$V_2 = (1 + \alpha i)R$$

$$= iR + \alpha iR$$

$$V_2 = (1 + \alpha i)R \quad \dots(ii)$$

$$\frac{V_2}{V_1} = \frac{1 + \alpha}{\alpha + 2}$$

146.(B)



Current at 4Ω resistance

$$\Rightarrow i - \frac{i}{4} = \frac{3i}{4}$$

voltage at 4Ω

$$v = \frac{3i}{4} \times 4 = 3i$$

Effective resistance

$$R = \frac{V}{I} = \frac{3i}{i} = 3$$

$$R = 3\Omega$$

147.(B) $I_C = c \frac{dv}{dt}$

$$= 20 \times 10^{-6} \times \frac{240}{1} = 4800 \times 10^{-6} A$$

$$= 4.8mA$$

148. (C) $I_{st} = 5I_{fl}$

$$\frac{T_{st}}{T_{fl}} = \left(\frac{I_{st}}{I_{fl}}\right)^2 \times s_{fl}$$

$$= (5)^2 \times 0.04$$

$$= 1.0$$

174. (C) $(P_{cu})_{new} = x^2 (P_{cu})_{fl}$

Where,

x is fraction of load

at half load P_{cu} is reduce by

$$(P_{cu}) = \frac{1}{4} \times 6400$$

$$= 1600W$$

and P_i (iron loss) remains the same

$$\text{new } P_{cu} = 1600w \quad P_i = 5000W$$