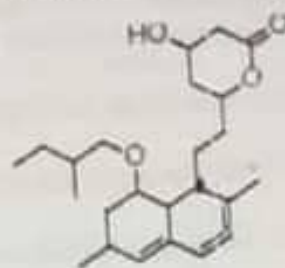


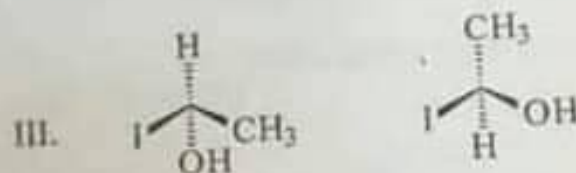
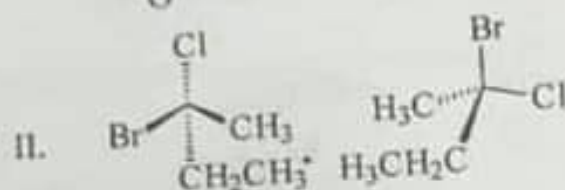
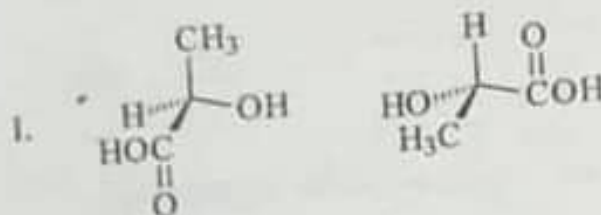
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- 1- How many stereogenic centers are there in Lovastatin (Mevacor® : a cholesterol lowering drug) ?



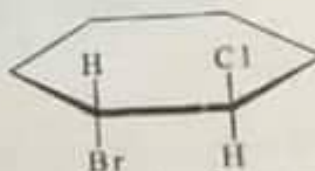
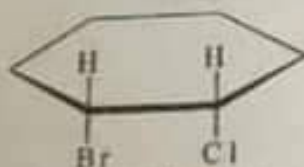
(Lovastatin)

- A) 4 B) 5 C) 6 D) 7 E) 8
- 2- Which pair of structures are enantiomers?



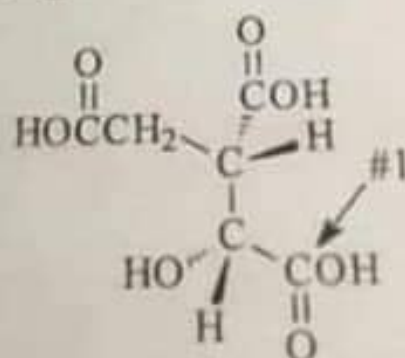
- a) I, II b) II, III • c) I, III d) I, II, III e) III

- 3- What is the relationship between these two structures?



- a) identical structures b) enantiomers • c) diastereomers d) constitutional isomers e)

- 4- What is the R,S configuration for the following structure of isocitric acid?



- a) 2-R, 3-R b) 2-R, 3-S c) 2-S, 3-R d) 2-S, 3-S e) 2-S, 3-S, 4-R

5. Which statement about enantiomers is false?

- a) enantiomers have the same boiling and melting points.
- b) enantiomers have the same chemical properties.
- c) enantiomers have the same atom connectivity.
- d) enantiomers have the same three dimensional orientation.**

6) Which of the following is/are optically inactive?

- every achiral compound
- a racemic mixture
- a meso compound
- a 50-50 mixture of R and S enantiomers

E) all the above

7) If (S)-glyceraldehyde has a specific rotation of -8.7° , what is the specific rotation of (R)-glyceraldehyde?

B) $+8.7^\circ$

5.D

6.E

7.B

8.C

9.D

10.A

11.B

12.C

13.D

14.A

15.B

16.C

17.D

18.A

19.B

20.C

21.D

22.A

23.B

24.C

25.D

26.A

27.B

28.C

29.D

30.A

31.B

32.C

33.D

34.A

35.B

36.C

37.D

38.A

39.B

40.C

41.D

42.A

43.B

44.C

45.D

46.A

47.B

48.C

49.D

50.A

51.B

52.C

53.D

54.A

55.B

56.C

57.D

58.A

59.B

60.C

61.D

62.A

63.B

64.C

65.D

66.A

67.B

68.C

69.D

70.A

71.B

72.C

73.D

74.A

75.B

76.C

77.D

78.A

79.B

80.C

81.D

82.A

83.B

84.C

85.D

86.A

87.B

88.C

89.D

90.A

91.B

92.C

93.D

94.A

95.B

96.C

97.D

98.A

99.B

100.C

101.D

102.A

103.B

104.C

105.D

106.A

107.B

108.C

109.D

110.A

111.B

112.C

113.D

114.A

115.B

116.C

117.D

118.A

119.B

120.C

121.D

122.A

123.B

124.C

125.D

126.A

127.B

128.C

129.D

130.A

131.B

132.C

133.D

134.A

135.B

136.C

137.D

138.A

139.B

140.C

141.D

142.A

143.B

144.C

145.D

146.A

147.B

148.C

149.D

150.A

151.B

152.C

153.D

154.A

155.B

156.C

157.D

158.A

159.B

160.C

161.D

162.A

163.B

164.C

165.D

166.A

167.B

168.C

169.D

170.A

171.B

172.C

173.D

174.A

175.B

176.C

177.D

178.A

179.B

180.C

181.D

182.A

183.B

184.C

185.D

186.A

187.B

188.C

189.D

190.A

191.B

192.C

193.D

194.A

195.B

196.C

197.D

198.A

199.B

200.C

201.D

202.A

203.B

204.C

205.D

206.A

207.B

208.C

209.D

210.A

211.B

212.C

213.D

214.A

215.B

216.C

217.D

218.A

219.B

220.C

221.D

222.A

223.B

224.C

225.D

226.A

227.B

228.C

229.D

230.A

231.B

232.C

233.D

234.A

235.B

236.C

237.D

238.A

239.B

240.C

241.D

242.A

243.B

244.C

245.D

246.A

247.B

248.C

249.D

250.A

251.B

252.C

253.D

254.A

255.B

256.C

257.D

258.A

259.B

260.C

261.D

262.A

263.B

264.C

265.D

266.A

267.B

268.C

269.D

270.A

271.B

272.C

273.D

274.A

275.B

276.C

277.D

278.A

279.B

280.C

281.D

282.A

283.B

284.C

285.D

286.A

287.B

288.C

289.D

290.A

291.B

292.C

293.D

294.A

295.B

296.C

297.D

298.A

299.B

300.C

301.D

302.A

303.B

304.C

305.D

306.A

307.B

308.C

309.D

310.A

311.B

312.C

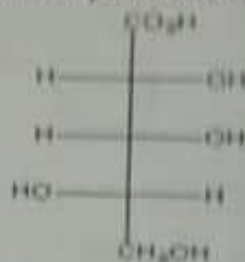
313.D

314.A

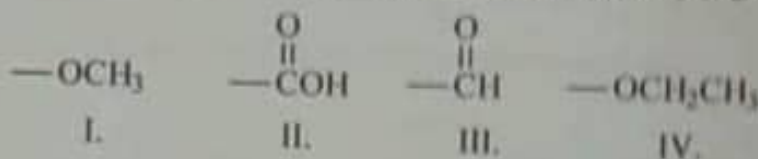
CO[C@H](Br)[C@H](Br)OC
CC(F)(Cl)CC

- 5- Which statement about enantiomers is false?
 a) enantiomers have the same boiling and melting points.
 b) enantiomers have the same chemical properties.
 c) enantiomers have the same atom connectivity.
 d) enantiomers have the same three dimensional orientation.
 e) enantiomers have the same density.
- 6- Which of the following is/are optically inactive?
 A) a 50-50 mixture of R and S enantiomers B) a meso compound
 C) every achiral compound D) a racemic mixture E) all the above
- 7- If (S)-glyceraldehyde has a specific rotation of -8.7° , what is the specific rotation of (R)-glyceraldehyde?
 A) -8.7° B) $+8.7^\circ$ C) 0.0° D) cannot be determined from the information given

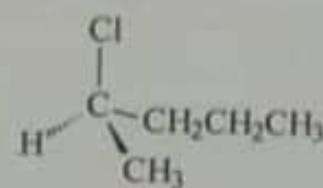
- 8- How many diastereomers exist for the compound below?



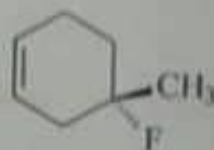
- A) 2 B) 4 C) 6 D) 7 E) 8
- 9- Rank the following substituents in order of decreasing priority (highest first).



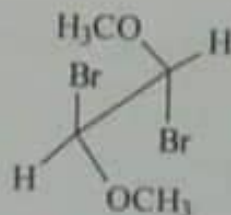
- a) II, III, IV, I b) III, IV, I, II c) IV, III, II, I d) IV, I, II, III e) IV, II, III, I.
- 10- Which of the following structures have the correct IUPAC name?



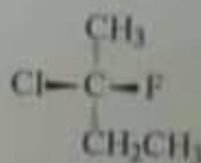
R-2-chloropentane
I



R-4-fluoro-4-methylcyclohexene
II



meso-1,2-dibromo-1,2-dimethoxyethane
III



S-2-chloro-2-fluorobutane
IV

- a) I, II b) III, IV c) I, III d) II, IV e) I, IV

5.D

6.E

7.B

8.C

9. D

10 C

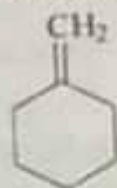
11- Which statements apply to an S_N1 reaction?

- I) The rate limiting step of the reaction involves the alkyl halide and the nucleophile.
 - II) The order of reactivity is methyl $>$ $1^\circ > 2^\circ > 3^\circ$.
 - III) The rate limiting step of the reaction involves only the alkyl halide.
 - IV) There is an intermediate carbocation.
- a) I, II • b) III, IV c) I, IV d) III e) IV

12- Assuming no other changes, what is the effect of doubling the concentration of the alkyl halide and the concentration of nucleophile in S_N2 reaction?

A) no change • B) doubles the rate C) triples the rate
D) quadruples the rate E) rate is halved

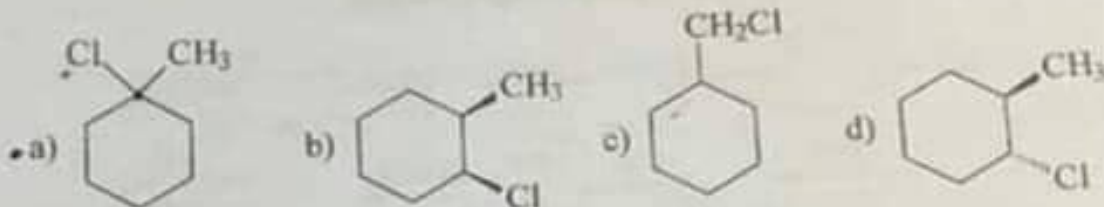
13- Which alkyl halide leads to the product shown, in an E2 reaction?



11- b

12 - b

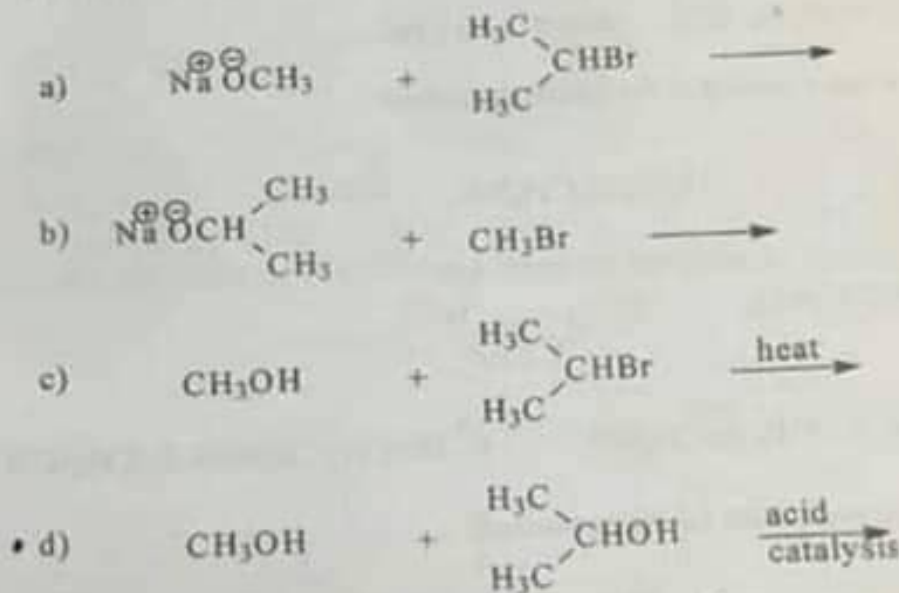
13- c



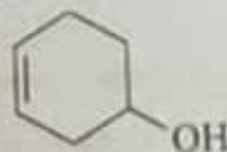
14-b

14- Which conditions are best for preparing isopropyl methyl ether?

15-b



15- Which is the IUPAC name for the following structure?

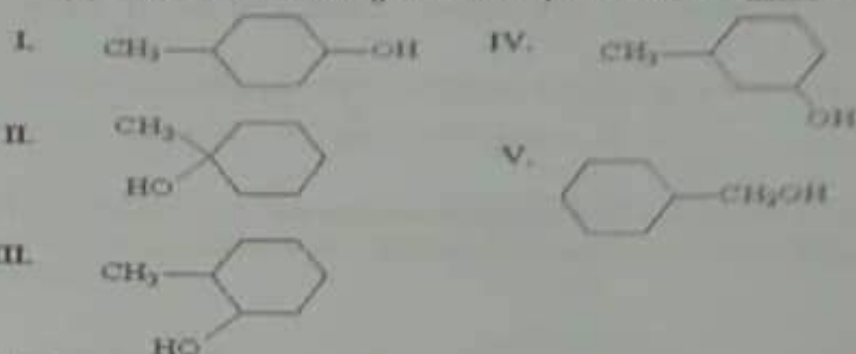


- a) cyclohexenol
d) 4-cyclohexenol

- b) 3-cyclohexen-1-ol
e) 1-cyclohexen-5-ol

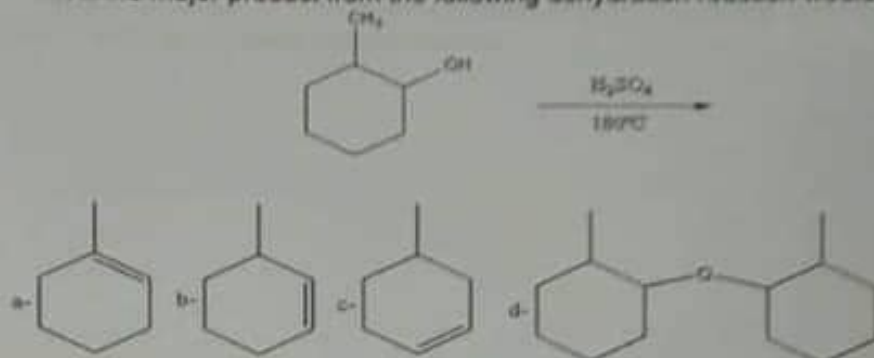
c) 1-cyclohexen-4-ol

21- Which of the following alcohols dehydrates with the fastest rate?



A) I B) II C) III D) IV E) V

22- What is the major product from the following dehydration reaction would be:



23- What can be said with certainty if a compound has $[\alpha] = -9.25^\circ$?

- A) The compound has the (S) configuration. B) The compound has the (R) configuration.
C) The compound is not a meso form. D) The compound possesses only one stereogenic center.
E) The compound has an optical purity of less than 100%.

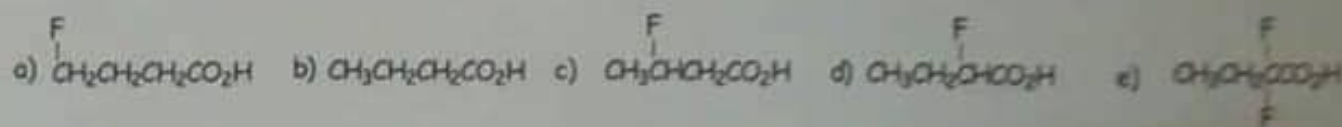
24- In which of the following pairs of alcohols do both members of the pair contain two or more hydroxyl groups?

- a) ethanol and ethylene glycol b) ethylene glycol and glycerol
c) isopropyl alcohol and propylene glycol d) t-butyl alcohol and s-butyl alcohol

25- Which of the following is an incorrect IUPAC name for a phenol derivative?

- a) 1-chlorophenol b) 2,5-dibromophenol c) 3-methylphenol
d) more than one correct response e) no correct response

26- Which of the following is the strongest acid?



27- Which of the following would you expect to have the highest boiling point?

- A. isopropyl alcohol B. t-butyl alcohol C. diethyl ether D. n-butanol

28- Why are alcohols unreactive toward nucleophilic substitution reactions?

- A) The hydroxide ion, a relatively strong base, is a very poor leaving group.
B) The hydroxide ion, a relatively weak base, is a very poor leaving group.
C) The hydroxide ion, a relatively weak base, is a very good leaving group.
D) The hydroxide ion, a relatively strong base, is a very poor leaving group.
E) Two of these

21 B

22 A

23 E

24 B

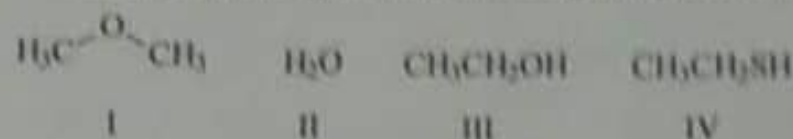
25 D

26

27 D

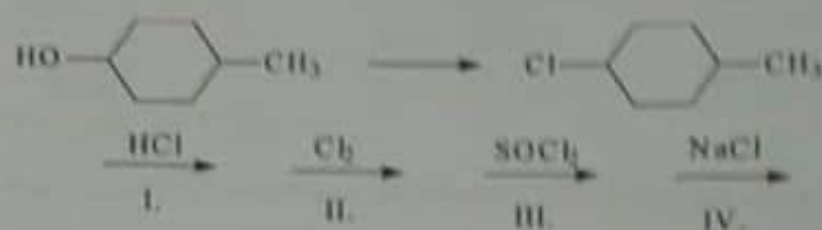
28 B

16- Arrange the compounds in the order of increasing boiling point (lowest first).



a) II, I, III, IV b) I, IV, II, III c) IV, I, III, II d) I, IV, III, II e) I, II, III, IV

17- Which reagents do not effect the following conversion?



a) I, II b) II, III c) II, IV d) I, III e) I, IV

16 D

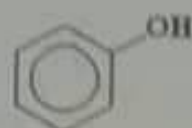
17 C_I

18- B

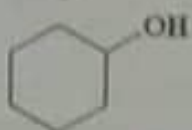
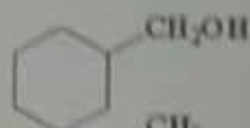
19- B^{II}

20- E^{III}

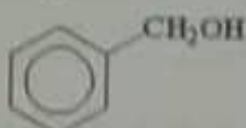
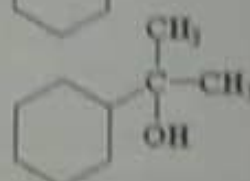
18- Which of the following alcohols is oxidized to a ketone by chromic acid?



IV.

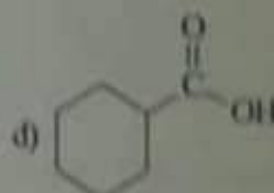
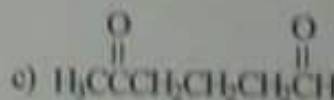
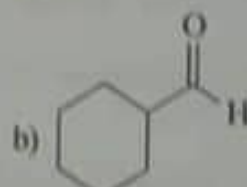
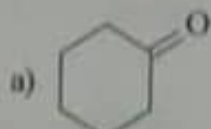
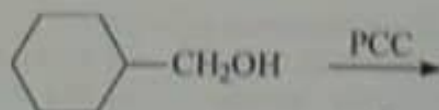


V.

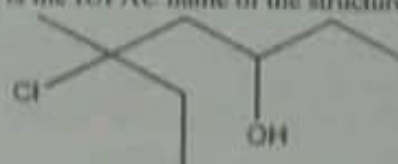


A) I B) II C) III D) IV E) V

19- Which is the product of the following reaction?

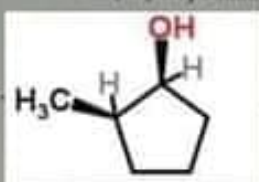
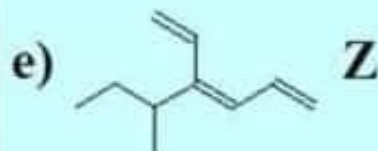
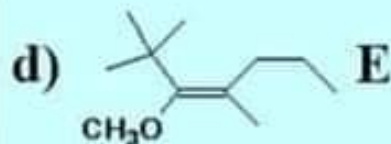
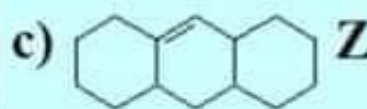
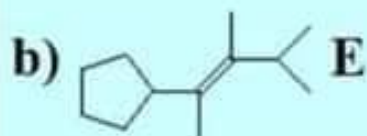
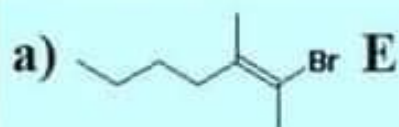
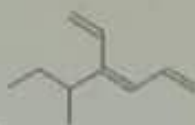
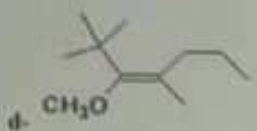
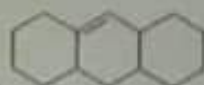
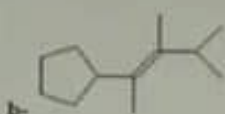


20- What is the IUPAC name of the structure below?



A) 5-chloro-5-ethyl-3-hexanol B) 2-chloro-2-ethyl-4-hydroxyhexane
 C) 5-chloro-5-ethyl-3-hydroxyhexane D) 5-chloro-5-methyl-3-heptanol
 E) 3-chloro-3-methyl-5-heptanol

a- cis-2-methylcyclopentanol

CC(C)(S)CCC(C)=CC(C)CCBr

Name of student :

Seat No:

[illegible][illegible]

29 B

30 B

31

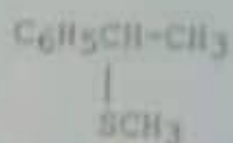
29- Which of the following is the weakest acid?

- a. phenol b. 3,4-dimethylphenol c. m-chlorophenol d. p-nitrophenol

30- Which of the following notations is *not* used to distinguish between pairs of enantiomers?

- a) *R* and *S* b) *E* and *Z* c) + and - d) D and L

31- When (*S*)-1-bromo-1-phenylethane undergoes an S_N1 reaction with methanethiol (CH_3SH), the product is the compound shown. What is/are the configuration(s) of the product obtained from this reaction?



- A) *S* only B) *R* only C) a mixture of the enantiomers, with higher amount *S* than *R*
D) a mixture of enantiomers, of equal amounts.