



IIT-JAM CHEMISTRY

TEST : STEREOCHEMISTRY

Time 00 : 45 Hour

Date : 25-06-2017

M.M. : 35

INSTRUCTION:

1. Attempt all the questions.
2. Section-A contains 10 Multiple Choice Questions (MCQ). Each question has 4 choices (a), (b), (c) and (d), for its answer, out of which ONLY ONE is correct. From Q.1 to Q.5 carries 1 Marks and Q.6 to Q.10 carries 2 Marks each.
3. Section-B contains 05 Multiple Select Questions (MSQ). Each question has 4 choices (a), (b), (c) and (d) for its answer, out of which ONE or MORE than ONE is/are correct. For each correct answer you will be awarded 2 marks.
4. Section-C contains 06 Numerical Answer Type (NAT) questions. Q.16 to Q.17 carry 1 Mark and Q.18 to Q.21 carries 2 Marks each. For each NAT type question, the value of answer in between 0 to 9.
5. In all sections, questions not attempted will result in zero mark. In Section-A (MCQ), wrong answer will result in negative marks. For all 1 mark questions, 1/3 marks will be deducted for each wrong answer. For all 2 marks questions, 2/3 marks will be deducted for each wrong answer. In Section-B (MSQ), there is no negative and no partial marking provisions. There is no negative marking in Section-C (NAT) as well.

PART-A

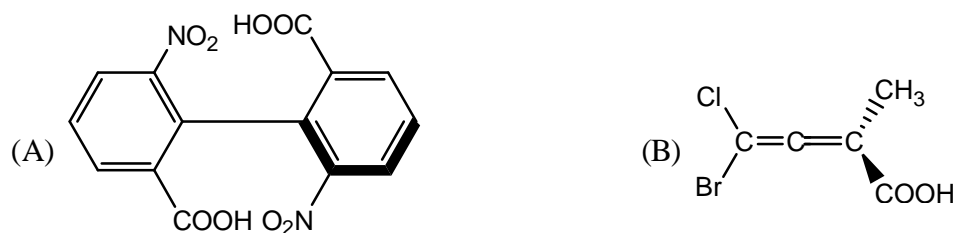
Q.1 to Q.05: Carry 1 Mark each.

1. The absolute configuration of the compound A and B, are respectively



- (a) R, S (b) S, R (c) R, R (d) S, S

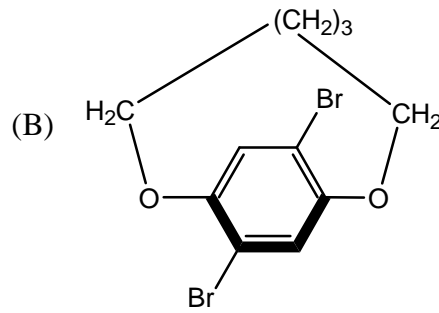
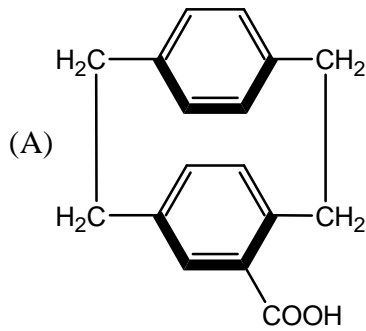
2. The absolute configuration of the compound A and B, are respectively



- (a) R, R (b) S, R (c) S, S (d) R, S

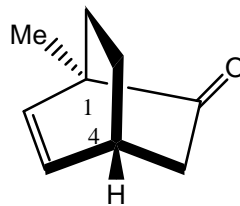


3. Assign the configuration of the following compound A and B, are respectively



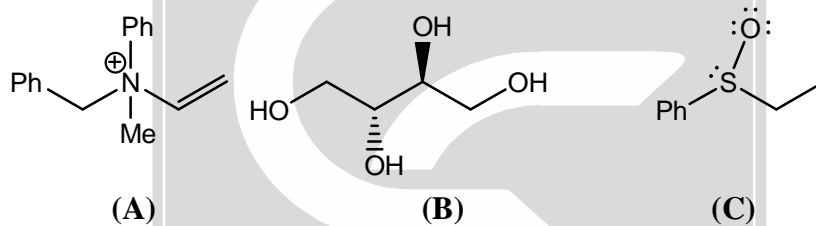
- (a) S, S (b) R, R (c) R, S (d) S, R

4. The configuration at the two stereocentres in the compound given below are



- (a) 1R, 4R (b) 1R, 4S (c) 1S, 4R (d) 1S, 4S

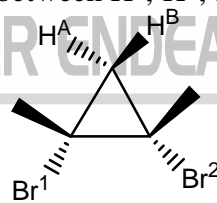
5. Among A-C, the compounds which can exhibit optical activity are



- (a) A, B and C (b) A and B only (c) A and C only (d) B and C only

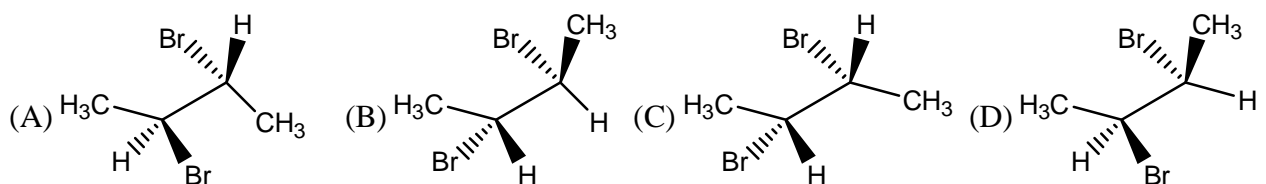
Q.6 to Q.10: Carry 2 Marks each.

6. In the compound give below, the relation between H^A , H^B ; and between Br^1 , Br^2 is:



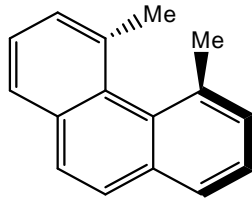
- (a) H^A , H^B are enantiotopic; and Br^1 , Br^2 are diastereotopic
 (b) H^A , H^B are diastereotopic; and Br^1 , Br^2 are enantiotopic
 (c) H^A , H^B are diastereotopic; and Br^1 , Br^2 are homotopic
 (d) H^A , H^B are enantiotopic; and Br^1 , Br^2 are homotopic.

7. Identify two enantiomers among the following compounds

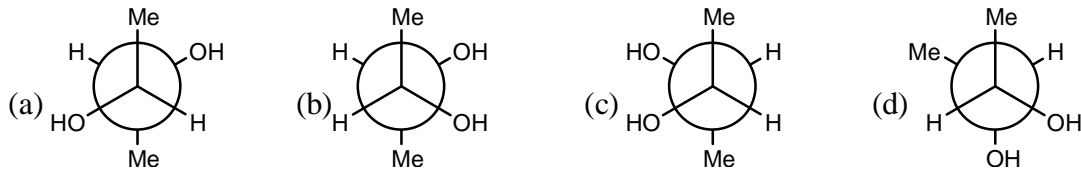


- (a) A and B (b) A and C (c) B and D (d) C and D

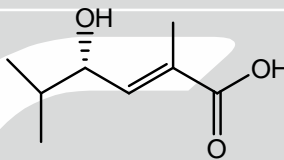
8. The correct statement about the following compound is



- (a) compound is chiral and has P configuration
 (b) compound is chiral and has M configuration
 (c) compound is achiral as it possesses C_2 -axis of symmetry
 (d) compound is achiral as it possesses plane of symmetry
9. Among the following, the Newmann projections of meso-2, 3-butanediol are



10. For the compound



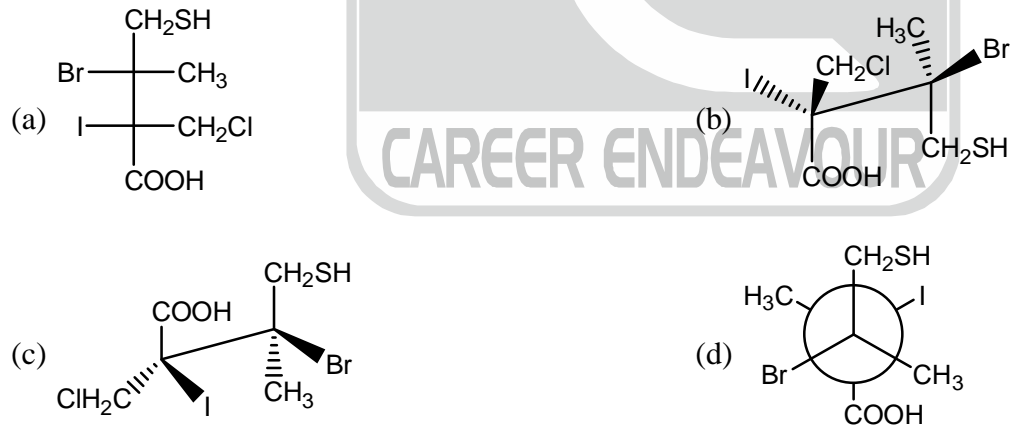
the stereochemical notations are

- (a) 2Z, 4R (b) 2Z, 4S (c) 2E, 4R (d) 2E, 4S

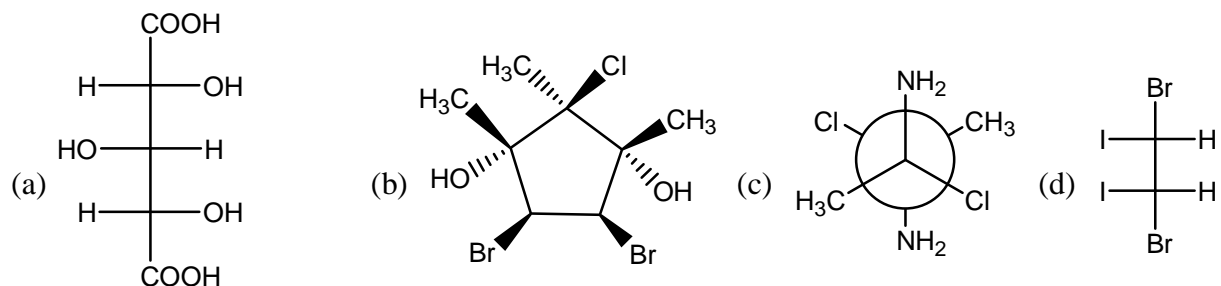
PART-B

Q.11 to Q.15: Carry 2 Marks each.

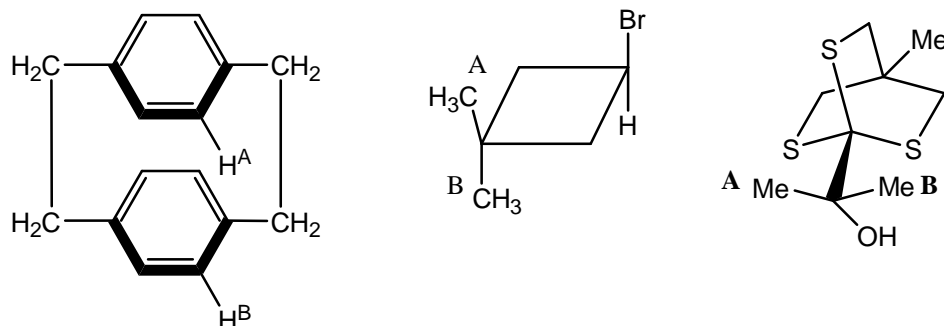
11. In the following compounds, which are identical



12. In the following structure, meso compound is/are

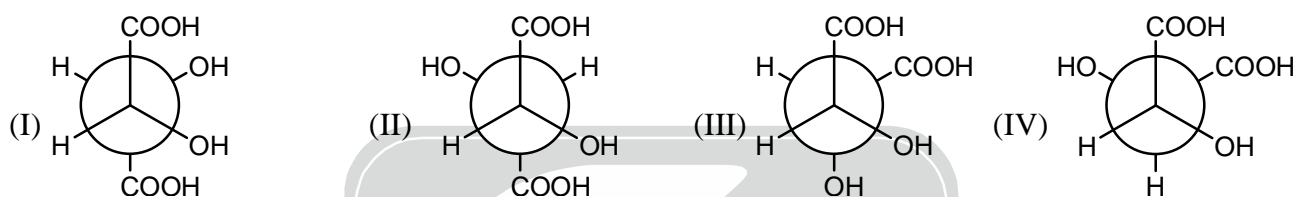


13. In the following compound, correct option is/are



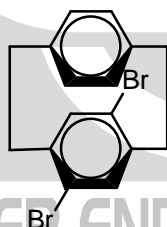
- (a) H^A and H^B are homotopic in nature
 (b) CH_3^A and CH_3^B are diastereotopic
 (c) Me^A and Me^B are enantiotopic
 (d) H^A and H^B are enantiotopic

14. In the given conformations, the correct option is/are



- (a) Conformers (I and IV) and (II, III) are identical and each is 2R, 3S
 (b) There are no enantiomeric pair
 (c) Projection (I and IV) of tartaric acid are diastereomeric with projection (II and III)
 (d) Projection (II and IV) are meso conformation of tartaric acid

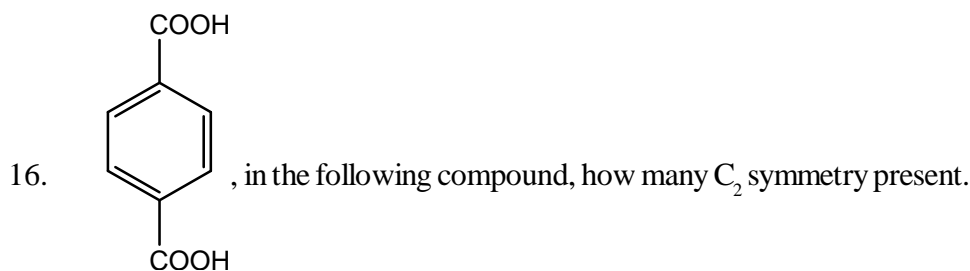
15. The correct statement about the following molecule is

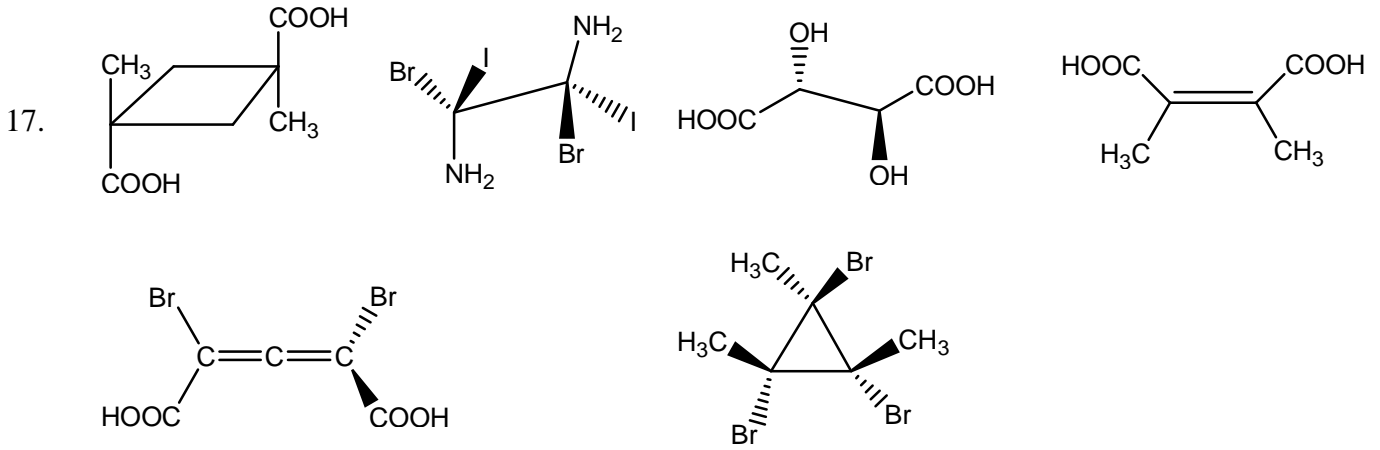


- (a) Molecule is chiral and possesses a chiral plane
 (b) Molecule is chiral and possesses a chiral axis.
 (c) Molecule is achiral as it possesses a plane of symmetry.
 (d) Molecule is achiral as it possesses a centre of symmetry.

PART-C

Q.16 to Q.17: Carry 1 Mark each.

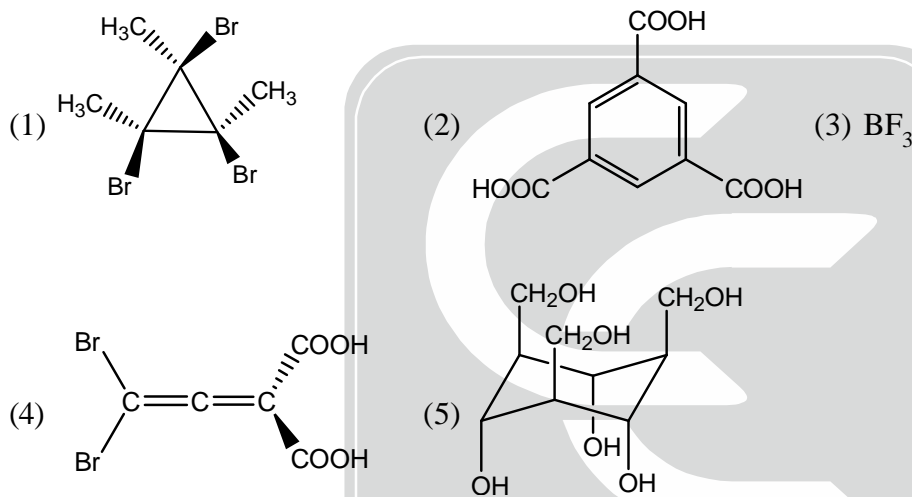




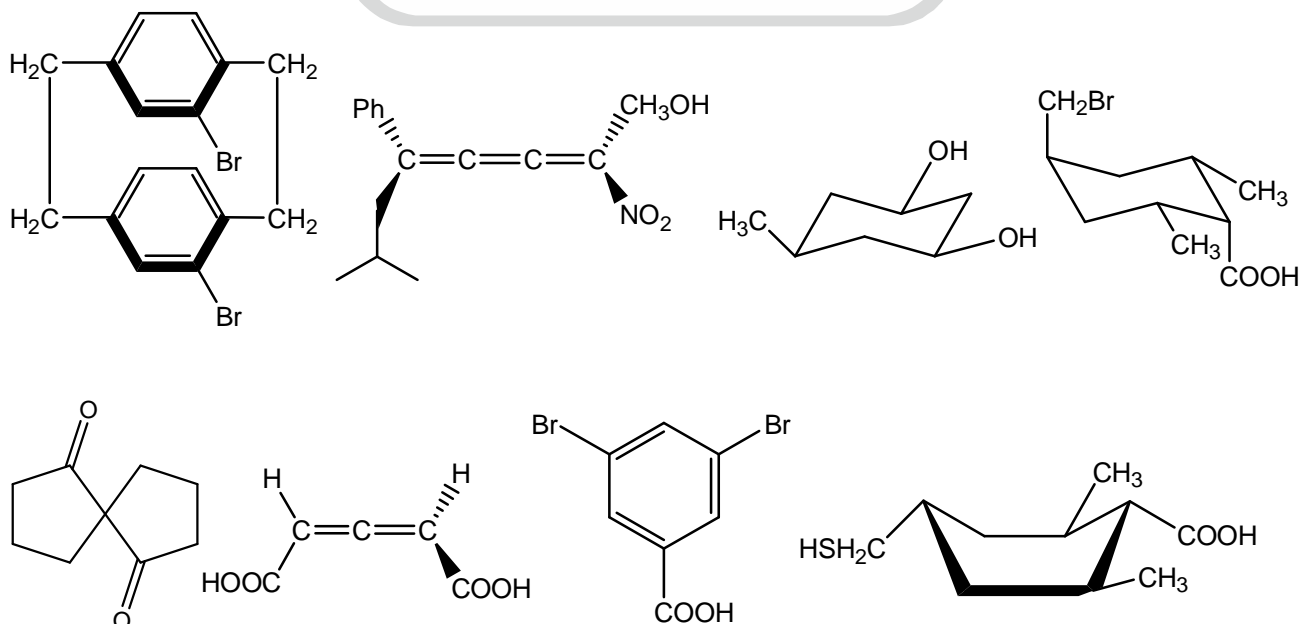
The number of compounds having C_2 axis of symmetry _____

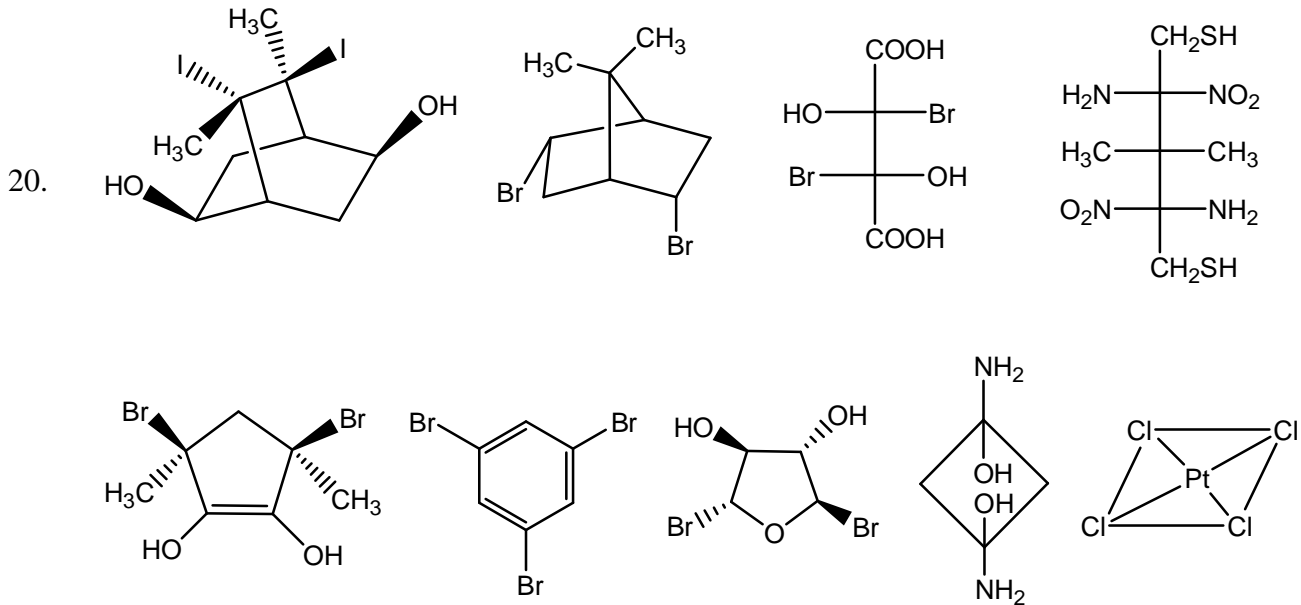
Q.18 to Q.21: Carry 2 Marks each.

18. The number of compounds having C_3 axis of symmetry _____



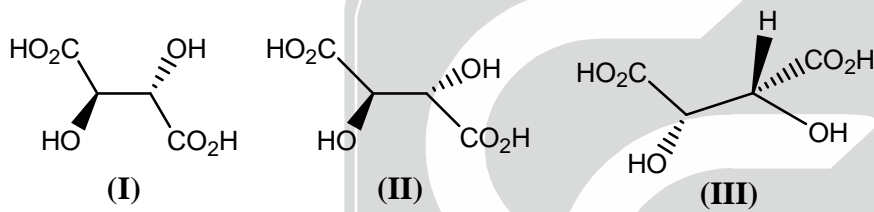
19. Total number of optically active compound is/are





The number of compounds having C_2 axis of symmetry _____

21. Consider the given structure, how many correct option is _____



- All are diastereomers
- All are identical
- Only I and III are diastereomers
- IUPAC name of compound II is 2R, 3R, tartaric acid.
- (I) and (II) are enantiomers
- (II) and (III) are diastereomers.
- (I) and (III) are identical.

CAREER ENDEAVOUR

Space for rough work





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ANSWER KEY

SECTION-A (Multiple Choice Questions (MCQ))

- | | | | | |
|--------|--------|--------|--------|---------|
| 1. (c) | 2. (b) | 3. (d) | 4. (a) | 5. (c) |
| 6. (b) | 7. (d) | 8. (a) | 9. (a) | 10. (d) |

SECTION-B (Multiple Select Questions (MSQ))

- | | | | | |
|-----------|---------------|-------------|-----------|---------|
| 11. (a,c) | 12. (a,b,c,d) | 13. (a,b,c) | 14. (c,d) | 15. (a) |
|-----------|---------------|-------------|-----------|---------|

SECTION-C (Numerical Answer Type (NAT))

- | | | | | |
|---------|---------|---------|---------|---------|
| 16. (3) | 17. (3) | 18. (4) | 19. (2) | 20. (8) |
| 21. (0) | | | | |

