PSYCHOLOGICAL TESTING -I

M.Sc., Psychology First Year

PRACTICAL

Semester – II, Paper-V

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FOREWORD

Since its establishment in 1976, Acharya Nagarjuna University has been forging ahead in the path of progress and dynamism, offering a variety of courses and research contributions. I am extremely happy that by gaining 'A^{+}' grade from the NAAC in the year 2024, Acharya Nagarjuna University is offering educational opportunities at the UG, PG levels apart from research degrees to students from over 221 affiliated colleges spread over the two districts of Guntur and Prakasam.

The University has also started the Centre for Distance Education in 2003-04 with the aim of taking higher education to the doorstep of all the sectors of the society. The centre will be a great help to those who cannot join in colleges, those who cannot afford the exorbitant fees as regular students, and even to housewives desirous of pursuing higher studies. Acharya Nagarjuna University has started offering B.Sc., B.A., B.B.A., and B.Com courses at the Degree level and M.A., M.Com., M.Sc., M.B.A., and L.L.M., courses at the PG level from the academic year 2003-2004 onwards.

To facilitate easier understanding by students studying through the distance mode, these self-instruction materials have been prepared by eminent and experienced teachers. The lessons have been drafted with great care and expertise in the stipulated time by these teachers. Constructive ideas and scholarly suggestions are welcome from students and teachers involved respectively. Such ideas will be incorporated for the greater efficacy of this distance mode of education. For clarification of doubts and feedback, weekly classes and contact classes will be arranged at the UG and PG levels respectively.

It is my aim that students getting higher education through the Centre for Distance Education should improve their qualification, have better employment opportunities and in turn be part of country's progress. It is my fond desire that in the years to come, the Centre for Distance Education will go from strength to strength in the form of new courses and by catering to larger number of people. My congratulations to all the Directors, Academic Coordinators, Editors and Lesson-writers of the Centre who have helped in these endeavors.

Prof. K. Gangadhara Rao

M.Tech.,Ph.D.,
Vice-Chancellor I/c
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M.Sc. Psychology Syllabus

SEMESTER - II

205SY24: PSYCHOLOGICAL TESTING -I

1. Raven's progressive matrices
2. Koh's Block design
3. Pass – along test
4. Weschler Adult Intelligence Scale (WAIS)
5. Differential aptitude test
6. David's battery of aptitude test
7. Thurstone interest inventory
8. Concept formation
9. Problem solving
10. Reasoning test

Note:- Any six of the above experiments to be conducted.

- Prof E.G. Paramesswaran, Prof. K. Ravichandra. Experimental Psychology. Neel Kamal Publications.
- Prof S.P. Chaube, Prof Akhilesh chaube Experimental Psychology. Neel Kamal Publications.

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INTRODUCTION TO INTELLIGENCE

Intelligence is the general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It reflects a broader and deeper capability for comprehending the surroundings in terms of making sense of things, or figuring out what to do. Intelligence tests are psychological tests that are designed to measure a variety of mental functions, such as reasoning, comprehension, and judgement. The goal of intelligence tests is to get an idea about an individual's intellectual potential. The test focus at the set of stimuli designed to yield a score based on the test developers' model of what makes up intelligence. Intelligence tests are often given as a part of the battery of tests.

An individual's raw scores on an intelligence test are typically converted into standard scores. The standard scores allow the examiner to compare an individual's score to other people who have taken test. Additionally, by converting raw scores to standard scores the examiner has uniform scores and can easily compare an individual's performance on one test with the individual's performance on another test. Depending on the intelligence test that is used, a variety of scores can be obtained. Most intelligence tests generate an overall intelligence quotient or IQ. It is valuable to know how an individual performs on the various tasks that make up the test. This can influence the interpretation of the test and what the IQ means.

An intelligence quotient (IQ) is a total score derived from several standardized tests designed to assess human intelligence the abbreviation "IQ" was coined by the psychologist William Stern for the German term Intelligenzquotient in 1912. Historically, IQ is a score obtained by dividing an individual's mental age score, obtained by administering an intelligence test, by his/her chronological age, both expressed in the terms of years and months. The resulting fraction is multiplied by 100 to obtain the IQ score. IQ scores are used for educational placement, assessment of intellectual disability, and evaluating job applicants. Even when students improve their scores on standardized tests, they do not always improve their cognitive abilities, such as memory, attention and speed.

From time to time a variety of definitions have been given by psychologists, but none of them is complete in itself. They may be grouped in the following five categories to better understand the nature of intelligence:

(i) Intelligence, as a general ability.
(ii) Intelligence, as the sum total of two or three different abilities.
(iii) Intelligence as the sum total of all the specific abilities.
(iv) Intelligence emphasize on adjustment or adaptation of the individual to his total environment.
(v) Intelligence stated as the ability to learn especially in the context of modern technology-I.T. Computer, Net, Whatsapp and Social Media.

1. Intelligence as a General Ability: This category was mainly supported by world renowned psychologists Galton, Ebbinghaus, Stout. Stem, Terman, Bart and Spearman.
Galton (1883) regarded intelligence as the power of discrimination and select.

Terman (1916) has defined intelligence, as the ability to carry out abstract thinking. By this, he means that through the manipulation of symbols (largely words) the intelligent person is

able to think about and deal with things and ideas without the presence of objects or ideas. Thus, it is the ability to solve the problem.
But, perhaps the most famous supporter of this category was Professor Spearman (1923) who defined intelligence as the general ability of the individual in having relations or correlations.

2. Intelligence is the Sum Total of Two or Three Abilities: it is supported by Binet (1905) who mentioned that intelligence is the ability or capacity to reason well, to judge well and to be self critical. It is a tendency to take and maintain a definite direction with adaptations of the environment.

Thorndike (1921) stated that intelligence is the ability to make good responses and is demonstrated by the capacity to deal effectively with novel situations. He further believed that intelligent activity is divided into three types:

(1) Social Intelligence - ability to understand and deal with persons.

(2) Concrete Intelligence - ability to understand and deal with things.

(3) Abstract Intelligence - ability to understand and deal with verbal and mathematical symbols.

But the most widely used definition of intelligence was given by Wechsler (1958) who defined intelligence "as the aggregate or global capacity of the individual to act purposefully to think rationally and to deal effectively with his environment. This definition specially stated that an individual's intelligence is revealed by his behaviour as a whole ('global') and that intelligence involves behaviour towards a goal which may be immediate (purposefully).

This definition also stated that 'drive' and 'incentive' enter into intelligent behaviour. And this aspect is probably included and implied in capacity to act purposefully' and to deal effectively with one's environment. This may be considered as a comprehensive definition and also encompasses the three views of intelligence presented.

To sum up all these trends and researches Tayler (1994) has identified three independent research traditions that have been employed to study the nature of human intelligence:

(i) The Psycho-metric approach where we examine the properties of a test through an evaluation of its correlates and underlying dimensions,

(ii) Information processing approach, where we try to understand how we learn and solve problems and finally,

(iii) Cognitive approach where we adapt the real world demands of these three approaches, the psycho-metric is the oldest and this is followed by many psychologists of the world specially Binet, Terman, Spearman, Sternberg, Wechsler, etc. (Kaplan and Saccuzzo, 2005).

Thus, in the opening chapter of the book, we have tried to understand the nature, meaning and concept of the intelligence and how it is useful in our life. Many psychologists, educationists and scholars have defined intelligence in their own way but the present authors have stated that intelligence is a general mental innate ability of the individual which operates itself in various forms. It is more fully manifested in the higher mental processes as compared to lower one's. It is specially active in dealing with novel situations or solving the

new problems. It also analyses the various aspects of experience and organizes them according to needs. Further intelligence in nurtured by many correlates or factors like heredity, environment, race and nation, age, sex, occupation, character, emotional factors, health and physique and use and application of technology. Therefore, present authors believed that this chapter is enough to provide the basic understanding of the nature, meaning and correlates of intelli-gence.

Here we are enumerated the various theories of Intelligerice as below
1. Binet: Unifactor theory of Intelligence (1916)
2. Spearman: Two factors theory of Intelligence (1904)
3. Spearman: Three factors theory of Intelligence (1927)
4. Thorndike: Multifactor theory of Intelligence (1927)
5. Pintner views of Inheritance of Intelligence (1931) (1938, 1943)
6. Thurstone: Group factors theory as primary mental abilities
7. Thomson Sample Theory of Intelligence (1939)
8. Hebb's Theory of Intelligence (1941, 1942) (1963)
9. Cattell's Theory of Fluid and Crystallized Intelligence (1941, 1943)
10. Guilford Theory of Structure of Intellect (1956, 1959, 1966)
11. Piaget Mental Growth Theory (1950)
12. Vernon's Hierarchical Theory of Intelligence (1960)
13. Himphrey's Hierarchical Model of Person's Ability (1962, 1970)
14. Jensen-Two-level process theory of Intelligence (1969, 1973)
15. Gardner, Multiplay Intelligence Theory (1983)
16. Theory of Emotional Intelligence by Mayer and Salovey (1993) Daniel Goleman (1995)
17. Theory of Social Intelligence (Thorndike, 1920)
18. Artificial Theory of Intelligence.

Mental Age (MA)
Is a unit of measurement for expressing the results of intelligence tests. Thus, concept was introduced with second revision of the Binet Scale in 1908. A subject's mental age is based on his or her performance as compared with the average performance of individuals in a specific chronological age group. For example, if a 6 year old child can perform tasks that the average 8 year old can do then the 6 year old child is said to have a mental age of 8.

We have seen that mental age is the level of development in intellectual ability expressed as equivalent to the chronological age at which the average group of individuals reach at that level e.g., a child with MA of 8 years has the level of the average group of 8 years old in the standardization sample. This concept is very useful in understanding whether the person is keeping in pace with his age in intellectual capacity or whether he is lagging behind or is ahead and if so, in which degree. This understanding gives clearcut picture and is extremely useful in detecting defectives or gifted and to counsel them. It helps to understand the needs and limitations of retarded and capabilities of average and gifted.

This concept which initially was hailed widely, was found to have some drawbacks in practice. This concept as given by Binet implies that intelligence is a trait which develops with age. Since intellectual development occurs more rapidly at the earlier ages and gradually decreases as the person approaches his mature limit, the curve of intellectual development rises at a decreasing rate with increasing age. As a result the mental age unit shrinks with corresponding age, and we cannot compare the children merely on the basis of mental age. A retardation of one year in the child of 6 years is more serious than the same amount of retardation in the case of a child of 12 years. A child of 4 years with M.A. of 3 years is almost on the border of mental retardation while one of 16 years with M.A. of 15 years is normal.

Intelligent Quotient (1.Q)

Now we can discuss about the 1.Q. which is the numerical index of intellectual assessment or it is a unit of measure for expressing the results of intelligence tests. Introduced by Terman (1916) in Standard-Binet Revision of the Binet-Scale, the 1.Q. is a ratio score specifically a subject's merital age as determined by his or her performance of the intelligence scale and chronological age and this ratio is then multiplied by 100 to eliminate fractions.

Classical

1.Q. The formula of classical L.Q. worked as absolute measure to compare the persons of different ages. It provided a uniform interpretation of I.Q. regardless of the age of the subject, I.Q. of 90 had the same meaning whether the person was of 6, 10, 15 or 25 years old. On the other hand MA of 6 years had different meaning with the persons of similar ages. The formula MA/CA x 100 gave a fraction which was not on age scales. It was 1.Q of the person and was considered to remain more or less constant throughout the person's life.

As intelligence tests are constructed in such a way that the mean MA should correlate with mean CA, I.Q. point of 100 became a symbol of average intelligence. From this reference point, it was easy to calculate average, below and above average I.Q.

$$\text{I.Q.} = \frac{\text{MA}}{\text{CA}} \times 100$$

If any child has the mental age = 12 years and chronological age is equal to 10 year then his IQ will be

$$\frac{12}{10} \times 100 = 120$$

He is a child of Superior Intelligence. Different Psychologists of the world has classified children into various categories of intelligence on the basis of obtained IQ as follows:

S. NO	I.Q. Range	Categories
1	140 and above	Genius
2	125-140	Very Superior
3	110-125	Superior
4	90-110	Average
5	75-90	Dull
6	50-75	Moron
7	25-50	Imbecile
8	0-25	Idiot

Classified Tests on the Basis of Language:

As all persons cannot understand the particular language and language tests are culture bond so we can classified them as:

(i) Verbal Tests-It contains many items in any language so respondent may gives his responses in an objective manner like Jalota Group Test of Mental Ability (11 to 16 years), G.C. Ahuja, Group Test of Intelligence (13 to 17 years).

(ii) Non-Verbal Tests Here different pictures, designs, matrics figures are given in form of items so they are culture free and can be used any where. Raven's Progressive Matrics and Cattell's Culture fair Intelligence Scale 1, 2, 3 can be included in this category.

(iii) Mixed Type Tests of Intelligence (V & N) Here verbal and non-verbal items are included as test iterns and they will assess the intelligence as verbal, scores, non-verbal scores and total intelligence scores. P.N. Mahrotra mixed type test of Intelligence and Kiran Saxena & R.P. Srivastava: A Group Test of Intelligence for children (7 to 11 years) belong to this category.

(iv) Mixed Tests of Intelligence (V & P)-Here verbal and performance items are given to provide verbal score, performance score and total score of Intelligence. Weschler Adult Intelligence Scale and Weschler Children Intelligence scale are the best examples of this category.

(v) Performance Tests of Intelligence in this category only performance through cards, Blocks or various activities can be done to achieve an I.Q. score. The best examples of this category are Pass-Along Test, Bhatia Battery of Performance Test and Pintner-Patterson Performances Scale of Intelligence.

EXPEREMENT -1

RAVEN'S PROGRESSIVE MATRICES

Introduction

Raven (1958) has developed the three progressive matrices in the year 1958; each item has design or matrix or pattern (plural-matrices) from which a part has been removed. The subject testee has to examine the matrix and identify which of the options given below, if fitted in, will complete the whole design or matrix. It is a measure of conceptual ability and only gives us a single 1.Q. score not measuring many abilities. It also measures abstract thinking clarity in perception and solves problems with systematic method of reasoning.

This test is highly correlated with Stanford Binet & Wechsler scale. Raven's group of tests does not give an IQ pointt for a subject but on the basis of scores, the subject is allotted one of the 5 grades of intelligence. On evaluating the ability of the test, it was found that it is universally accepted, used and popular with high reliability and validity. It can be easily administered on a group, takes short time, easy to administer, score and has wider application. It is free from language-culture barrier and can be successfully used on deaf or speech problems children. There are 3 sections of progressive matrices which are used according to the purpose and various age groups, as given below.

Raven's Coloured Progressive Matrices (1947, 1956, 1998) Sets A, AB, B

The coloured progressive matrices (CPM) consist of 36 items in three sets of 12 A, AB and B and they are arranged to assess main cognitive processing of children under 11 years of age and all the 36 problems as a whole are designed to assess the mental development upto intellectual maturity. CPM can also be used to assess the degree or level where intellectual functions have been deteriorated. This matrix can also be used on senior citizens of 65+ where they have neurological and language complications. Many studies have confirmed that CPM is having satisfactory reliability whether assessed by split half or retest methods.

Reliabilities of 0.67, 0.80, 0.78, cronbach Alpha of 0.94 were reported. The validity of this test was also reported very high by many researchers in cross-cultural, clinical and educational settings.

AIM:

TO MEASURE THE SUBJECTS LEVEL OF INTELLIGENCE

Material:

Raven's Progressive Matrics book let and manual.

Procedure:

The subject is seated comfortably in a room with no distractions. Particulars of the subject are filled on the top portion of the answer sheet. The test booklet is given to the subject and is asked to open the first page where illustration "A" is pointed. The subject is instructed as follows: " Look at this (pointing to the upper figure A1) It is a pattern with a bit Missing-Below, (pointing to the bits that are below on the page) is the right shape to fit into the space. Write down the number of the pattern that first correctly in the answer sheet. Answer each problem one after the another as they are interlinked.

After the instructions are given to the subject, he or she is asked to go through and complete the test. There is time limit for the test, but approximately 45 to 60 minutes are generally taken to answer the test.

The answers of the subject are scored with the help of the scoring key that is found in the manual and are assessed for percentile ranking and the intellectual level in terms of grades.

RESULTS:

1. Table I: Individual data Sheet.
2. Table II: Group Data.

Table – 1

INDIVIDUAL DATA

S.No	A	B	C	D	E
1 2 3 4 5 6 7 8 9 10 11 12					

Table - 2

GROUP DATA

S.No	Subject Name	Score	Percentile	Grade
1				
2				
3				
4				
5				
6				
7				

The Scores are evaluated as per the manual in the following format

Grade 1	Intellectually Superior	Score lies above 95th percentile.
Grade II	Above Average Intellectual. Capacity	Score lies between 75th and 95th percentiles.
Grade III	Intellectually Average	Score lies between 25th and 75th percentiles.
Grade IV	Below Average Intellectual. Capacity	Score lies between 5th and 25th percentiles
Grade V	Intellectually impaired	Score lies below 5th percentile

Percentile Norms are given on the various age group samples collected throughout the world for interpretating the results.

EXPEREMENT -2

KOH'S BLOCK DESIGN TEST

Introduction:

Introduction: Intelligence is the ability 0| and Skills typically defined as acquire and apply knowledge. The ability to carry out abstract thinking - Terman

Intelligence is the capacity to act purposefully, lo hink rationally and to deal effectively. the environment Wechsler.

Intelligence is the mental abilities necessary adaptation to, for as well as shaping and selection of any environmental tontex. Robert stanberg.

Intelligence involves vanous cognitive processes such as problem solving, Reasoning, Learning, Memory & Adaptation.

The kohl block intelligence. non-verbal test rest is a designed to assess a intelligence child's spatial reasoning, problem solving and abstract thinking skills. It is a cultural fairness test - suitabk for a diverse range of populations.

Aim:

To Assess the intellectual ability of the Subject.

Material used

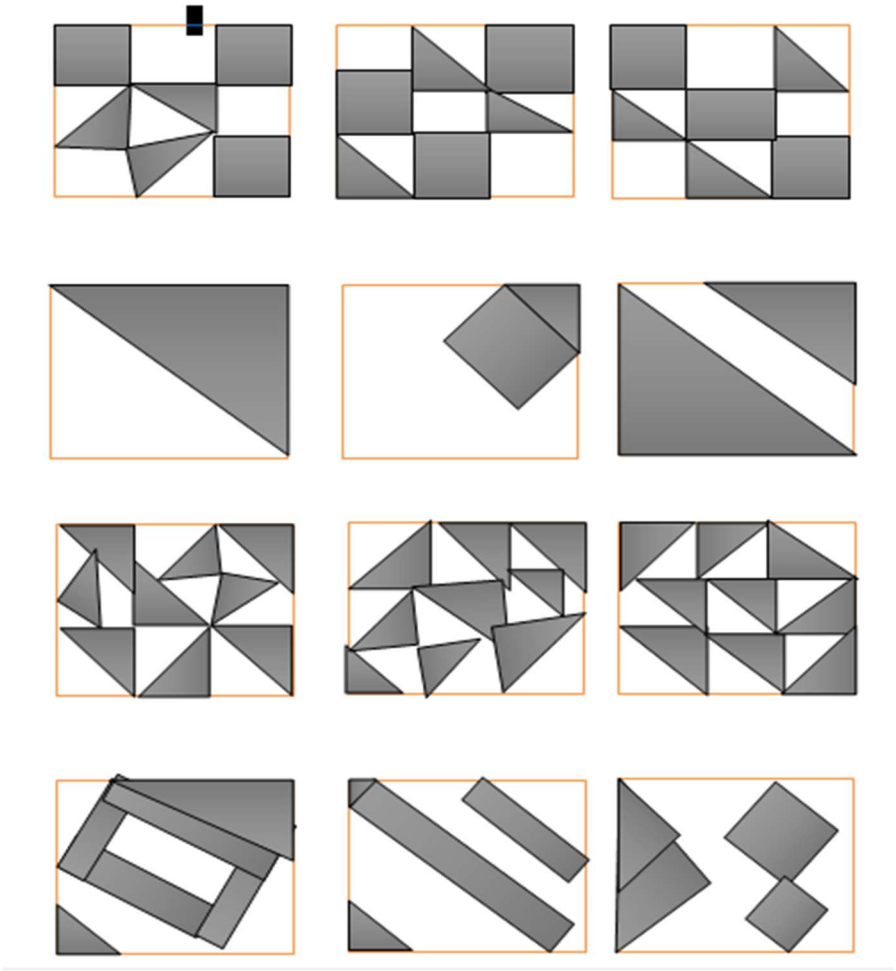
wooden blocks, scoring sheet, Timer, manual, Test booklet.

Description

Kohl's Block Design Test is consisted of 17 items. The test measures analytic and synthetic abilities with abstract intelligence. It also requires matching of colour and design patterns together. It consists of 17 items (cards); each card consists of design to be made from multicolored blocks The table 1 scores of the manual show that score values of the 17 designs and the number of score points to be deducted in a design are successfully completed with excess time and excess move. Here, maximum score is 131 points with a mental age of 19 years. (1 month) is the lowest score which is equal to 5.3 mental age.
Procedure

First, the subject is seated comfortable position. And are given the following instructions. It is an ability test. The test consists of a series of patterns that increase in Complexly as the test progresses. The subject has amount of time to replicate the pattern using the blocks. Each design has a specific time limit. The subject performance and records the results on a table, the scoring criteria is based on the accuracy and speed of the subjects response.

Model cards Used in Kho's Block Design



Results

The Results are calculated as per the manual

Model Scoring Sheet

Design Number	Time	Score
1		
2		
3		
4		
5		
6		
7		

The score thus obtained is converted into mental age based on this IQ of the subject is calculated by using

IQ= MA / CA X 100. Then the subjects IQ is interpreted as average, below average or above average.

Conclusion: The subject IQ = ----------

EXPEREMENT -3
ALEXANDER PASS-ALONG TEST

Introduction
Intelligence is the ability to learn from experience, solve problems and use our knowledge adapt to new Situations. The ability to carry out abstract thinking- Terman 1.5 think rationaky, and to deal wechsler. Intelligence is the capacity to act purposefully, effectively with environment Intelligence is adaptation to, shaping and selection of, any Environmental Context. is the mental abilities necessary for as well as

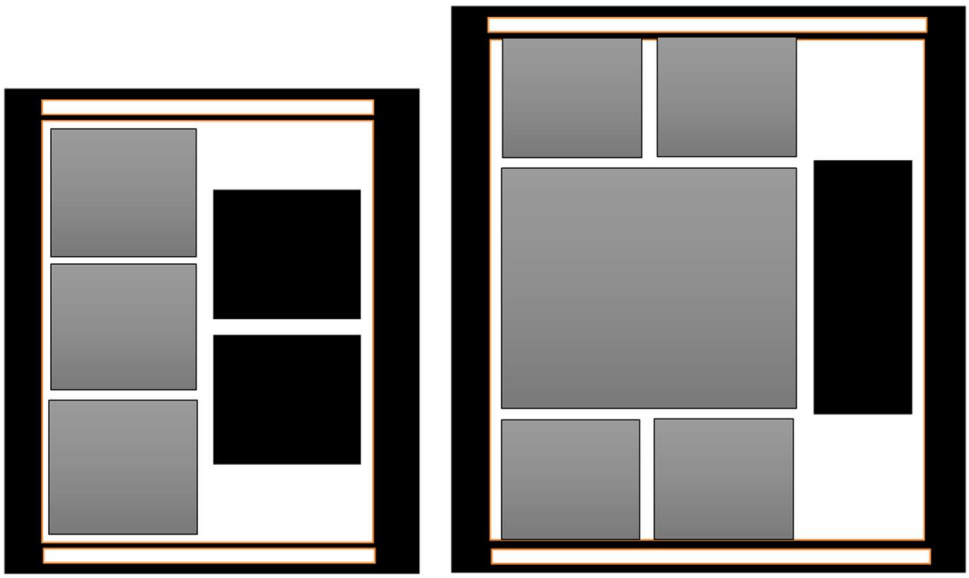
Intelligence involves various cognitive processes such as problem solving, reasoning & Adaptation. The passalong test, that measures. Intelligence by having a Subject to move blocks around a tray to match a design on the cards. The test was invented by W.P. Alexander around 1937. It is a performance test, culture free, Individual and point Scale test, Non-verbal also.

Aim
To measure the intelligence of the subject.

Materials used:
wooden blocks, scoring Sheet, Timer manual.
It measures concrete or practical intelligence including perceptual accuracy and judgment. It has eight sets of cards and make nine designs-Card B-1 is having 1 x 1" one red and 1 x 1" two blue blocks, card B-2 malware design 2 and 3 is having 1 x 1" two Red and 1 x 1" 3 blue blocks, card B-3 for design 4 is having one 2 x 2" Red and 1 x 1" six blue blocks, card No. 4 for design 5 is having one 2 x 2" Red Block, one 2 x 1" Blue Block and 4, 1x1" blue Blocks, card B-5 for design 6 is having one 2 x1" Red Blocks 1 x 1", 4 Blue Blocks and 2 x 2" one Blue Block, Card B-6 is having 2 x 1" Red Block, 2 x 1" 2 blue blocks and 1 x 1" four blue blocks, for desigr. 8 B-7 card is having one 2 x 1" Red Block, 2 x 1" two blue Blocks, and 1 x 1" four blue blocks, and for design 9, B-8 card is having 2 x 1" one red block, 2 x 1" two blue blocks and 1 x 1" four blue blocks. Thus, with all the nine designs, 13 blocks of different size and both the colours were used. Two precautions should be taken while using this test-

Two diagrams should not be shown to the subject simultaneously, and
The subject should not see any box being prepared for use.

This test is useful for children from 7 years to 20 years, and is also useful for deaf children. Here is the scoring procedure of the test which has proved quite satisfactory in practice.



Procedure

The subject is seated comfortably. Subjects are shown the test cards one after the another and asked to make the pattern of the card. The subject is instructed not to lift the block while making the design he has to only move the block to make the pattern. Thus the results of the subjects are noted as per the card number and time taken successively. The results are evaluated as per the scoring key given.

Results and Discussion

The Subjects Results Are Scored as per the Scoring Key Given below

SCORING METHOD

Subtest or Card No	Time Limit	Full Score	Deductions
1.	2 minutes	2	1 for every minute or part of there of more than 1 min.
2.	2 minutes	3	1 for every 10 sec or part of there of more than 1 mins
3.	3 minutes	5	As above
4.	3 minutes	5	As above
5.	3 minutes	5	As above
6.	3 minutes	5	As above
7.	3 minutes	5	As above
8.	4 minutes	7	1 for every 30 sec or part of there of more than 1.5 mins
9.	5 minutes	8	1 for every 10 sec or part of there of more than 2 mins

AGE NORMS FOR SCORE	
Mental Age in Years	Score
7 Years 6 Months	11
8 Years 6 Months	13
9 Years 6 Months	16
10 Years 6 Months	19
11 Years 6 Months	21
12 Years 6 Months	24
13 Years 6 Months	27
14 Years 6 Months	29
15 Years 6 Months	32
16 Years 6 Months	35
17 Years 6 Months	37
18 Years 6 Months	40
19 Years 6 Months	42

Maximum Possible Score = 45

Conclusion:

The IQ of the Subject is _____

EXPEREMENT - 4

WECHSLER ADULT INTELLIGENCE SCALE

Introduction

By 1932, Wechsler was appointed as Chief Psychologist at Bellevue Manhattan, needed an instrument suitable for evaluating the intellectual capacity of multilingual, multinational and multicultural clients being referred there. Seven years after his appointment, in 1939, the thought of Wechsler of measuring adult's intelligence by an individually administered test came to reality in the form of the Wechsler-Bellevue Intelligence Scale (1939). After three years, in 1942, came a revision of that test referred to variously as the Wechsler-Bellevue-Il and as the Army Wechsler, but some serious problems were identified with (1942) the revision of Wechsler Bellevue II like (i) the standardization sample was rather restricted, (ii) some sub-tests lacked sufficient inter-item reliability, (iii) some of the sub-tests were made up of items that were too easy, and (iv) the scoring criteria for certain items were too ambiguous so its use was totally restricted. Sixteen years after publication of Form I of the W-B (Wechsler-Bellevue), a revised form with 9 new names was published.

Wechsler Adult Intelligence Scale (WAIS) 1955

Wechsler Adult Intelligence Scale (WAIS) was first published in 1955. The scale has 257 items, out of which 147 items have been retained and they were comprised of 11 subtests-six under verbal scales-(i) Information, (ii) Comprehension, (iii) Arithmetic, (iv) Vocabulary, (v) Similarities and (vi) digits span and five under performance scales (i) Break design, (ii) picture completion, (iii) picture arrangement, (iv) object assembly and (v) digits symbol, thus we can get 3 quotients-Verbal Quotient (VQ or Verbal I.Q.), Performance Quotient (PQ) or Performance (I.Q.) and combining both of these we have full scale I.Q. It is based on a normal curve distribution through the population. Discrepancies in verbal and performance 1.Q.'s (scaled subtest scores) within any subtest (intratest variability in functioning. Therefore, Wechsler Adult Intelligence Test (WAIS-R) is the best standardized and the most widely used adult individual test in clinical practice. It is specifically designed for adults, ranging in age from 16 to 64 years.

Wechsler Adult Intelligence Scale (Revised) 1981

Wechsler's revision of the Wechsler Adult Intelligence Scale-Revised (WAIS-R) was published in 1981 which is the standard with which other WAIS-R standardization is sound, and a number of studies have shown it tests of adult intelligence are compared and by which they are judged. The to be a reliable and valid measure of adult intelligence.

Third U.K. Edition of Wechsler Adult Intelligence Scale (WAIS-III) 1997

In 1997, Third U.K. Edition of Weschler Adult Intelligence Test was prepared with some modifications with U.K. sample. The latest edition of Wechsler Adult Intelligence Scale has been developed in 1997, known as R; symbol search, which was adapted from the WISC-III and two new sub-WAIS-III. It contains 14 sub-tests-11 sub-tests are retained from the WAIS-tests, matrix reasoning and letter-numbering sequencing. The WAIS-III also provides another grouping of the sub-tests based on more refined domains perceptual organization, working memory and processing speed. The test of cognitive functioning. These index scales are verbal comprehension, disorders affecting mental functioning. It is also useful for

intellectual is very useful for the differential diagnosis of neurological and psychiatric assessment as part of managerial selection and training and development programme.

Indian Adaptation (Verbal Scale of WAIS) in Hindi

Description

Indian adaptation of WAIS-R verbal sub-tests and its Hindi translation was also prepared by Pershad et al (1988) and standardization was done by Verma et al (1988). It has four sub-tests, viz., information, arithmetic, digit span and comprehension. The basic difference between WAIS-1955 and revised standardization form was that the few items were added and others were suitably changed. The scoring procedure for information and comprehension sub-tests were same as for Wechsler test. The revised scoring system for digit span sub-test was accepted after verifying its superiority over the earlier one. In the revised form both the series of alternate digits are administered and if the subiect passes one of the two alternate series of a particular length, a score of one is given and if both the series are passed then he gets a score of two. The test is continued until he fails on both the series of a particular length. In arithmetic sub-test. the scoring procedure is that the items are scored only if correct responses are given by the subjects within time limit. Extra bonus points are given for rapid and correct performance for the items 10-14. The time limit for items 1-9 is, however, generous. The extra bonus system was considered and reported to be helpful to those with average or low intelligence. It was standardized on a representative sample of Hindi speaking population and a number of psychiatric centres with the unit of clinical psychology. The test has test-retest and split half reliability as well as concurrent, construct and content validity (Bhargava & Bhargava, 2018). 10. Wechsler Intelligence Scale for Children-Revised (WISC-R). This scale was constructed in 1949 and its revisions were brought out in 1974, 1989, 1991 and 2000. It is an individually administered clinical instrument for assessing the intellectual ability of children aged 6 to 16 years 11 months. It contains 12 sub-tests-6 verbal and 6 performance as below:

Aim

To Measure the intelligence quotient of the subject

Material

WAIS: Indian Adaptation (Performance Scale of WAIS)

Wechsler Adult Intelligence Scale was adapted by Ramalingaswamy (1974) in Indian culture, namely Wechsler Adult Performance Intelligence Scale (WAPIS). The final form of this scale has only performance sub-tests i.e., picture completion digit symbol, block design, picture arrangement and object assembly. Picture completion and picture arrangement have been modified and other sub-tests remain the same. The time limit is 20 minutes. The scale was standardized on 604 persons, both males and females, between the ages from 15 to 45 years. The reliability was estimated by Cronbach's coefficient Alpha and the scale has factorial and construct validity.

Procedure

The subject was seated comfortably and the Indian adaptation of WAIS is administered to the subject as per its instructions. This scale is a performance test. The sub test is given to the subject as per the instructions.

Wechsler Adult Intelligence Scale (1955) The norms of this scale are based upon a sample of 1,700 persons, 850 for each set, from four widely separated geographic areas. The

subjects ranged in age from 16 to 64 years. Supplement data were also obtained for a sample of olden person (N=352) above 65 years of age. The scale has six subtests consisting the verbal scale and five subtests consisting the performance scale.

Verbal Scale		Performance Scale	
1. Information test	(27 score)	1. Picture Arrangement	(7)
2. Comprehension	(10)	2. Picture Completion	(15)
3. Digit Span		3. Block Design	(7)
4. Arithmetic	(10)	4. Object Assembly	(3)
5. Similarities	(12)	5. Digit Symbol Test	
6. Vocabulary	(45)		

The reliability coefficients are highly satisfactory. Its reliability is more than 0.80.

Results

The scores obtained by the subject in the above are scored as per the manual. The results are noted in table I similarly the IQ scores of the group are shown in table II

Conclusion

The subjects IQ is _____.

EXPEREMENT -5
DIFFERENTIAL APTITUDE TEST

Introduction
The differential aptitude tests were developed to provide an integrated, scientific and well standardized procedure for measuring the abilities of boys and girls in grades eight through twelve for purposes of educational and vocational guidance. While the tests were constructed primarily for use in junior and senior high schools, they may be used also in the educational and vocational counseling of young adults out of school and in the selection of applications for employment.

They were designed to meet the expressed needs of guidance counselors and consulting psychologists, whose advice and ideas were sought in planning for a battery which would meet rigorous standards and be practical for day-by-day use in schools; social agencies and business organization.

The differential aptitude tests represent a logical development in the long and steady progress in the theory and practice of mental measurement. Binet recognized that mental ability is complex and insisted that tests should consist of samplings of many kinds of mental activity.

Thus since from 1920's there has been a growing recognition of the need for measures of many aspects of mental ability. The studies of Thorndike, Kelly, spearman, Thomson and others have revealed that so called intelligence is not a unitary trait it is composed of many abilities, which are present in different individuals in varying amounts. A student may have excellent verbal facility, yet lack numerical or mechanical aptitude. A test which contains items which measure several of these aptitudes, much as it reveals of the true potentiality of the student.

Aim:
To Measure an individual ability to acquire through future training in some specific skills.

Materials:
An aptitude is a condition or set of characteristics regarded as symptomatic of an individual's ability to acquire with training some (usually specified knowledge, skill or set of responses, such as the ability to speak a language, to produce music thus, the total concept can perhaps be summarized by regarding aptitude as simply a capacity to learn.

The Differential Aptitude Tests were developed as an integrated battery. The standardization of all eight tests is based on a single population. The range of levels is the same for all parts of the battery. Practical matters such as format, Instructions, answer sheets and time limits were carefully worked out after extensive experimental investigation.

The Differential Aptitude Test measure the following aptitudes:

1. **Verbal Reasoning**: This test measures the ability of a student to see relationships among words. The test consists of analogies.

For example: …….is to bark as cat is to …….

Select one of the following answers.

A maiow ------- kitten

B dog --------miaow

C dog ------scratch

D seal -------- kitten

E tree -------- Scratch

This test assesses the ability to infer the relationship between the first pair of words and apply the relationship to the second pair of words. Verbal reasoning may be useful in helping to predict success in academic courses as well as in occupations where accurate communication is important. This includes business, law, education, marketing, public relations, the arts, and journalism. It has particular relevance for English, Irish, and other languages, as well as History. In these areas of study a great deal of reading is involved. Those with well-developed verbal reasoning will usually be good at finding the words to explain ideas and will be able to interpret written and spoken instructions. They will also be able to absorb lectures without losing concentration or becoming confused or left behind. If a percentile in verbal reasoning is below 10, a student may be entitled to learning support from within the school. If the score is below 9 he should apply for a waver in state exams, if below 2, he should apply for resource hours.

2. Numerical Ability:

This test measures the ability to perform mathematical reasoning tasks. In order to ensure that reasoning rather than a computational facility is stressed, the computational level of the problem is low.

Numerical reasoning is important for success in courses such as mathematics, physics, chemistry, accounting, actuary, economics, engineering, trades such as electrician, and carpentry as well as banking, insurance, computing, and surveying. For general business courses – all of which have some mathematical component – good numerical reasoning can prove valuable. Those with high numerical reasoning will enjoy using numerical/statistical data and use these creatively and accurately. The numerical score alone is not enough to predict ability in honours Maths which also requires a high level of abstract reasoning

3. Abstract Reasoning

This test is a non-verbal measure of reasoning ability. It assesses how well individuals can reason geometric shapes or design. Each test item is a geometric series in which the elements change according to a given rule. The student is asked to infer the rule/s that are operating and predict the next step in the series.

This type of abstract reasoning is a measure of an individual's logical, analytical, and conceptual skills. This skill is important in courses or occupations that require the ability to see relationships among objects in terms of their size, shape, position, and quantities, and where the ability to analyse dynamic changes and project them forward in time. Examples include mathematics, computer programming, architecture, and mechanics, as well as law, medicine and economics. It is also useful in courses such as economics that requires an individual to envisage cause and effect in situations were it is important to predict the future based on past events and trends, for example, market trends in the financial sector.

Individuals with good abstract reasoning will usually work out problems for themselves and will often challenge ideas that fail to be convincingly though through or explained.

4. Space Relations

This test measures the ability to visualize a three-dimensional object from a two dimensional pattern and to visualize how this object would look if rotated in space. Each problem shows one pattern, followed by four three-dimensional figures. The student is asked to choose the one figure that can be made from the pattern.

Example: The student is show a 3 D shape and asked to fold it (in his mind) and the

Occupations in which an individual is required to imagine how an object would look if made from a given pattern include, architecture, design courses, carpentry, civil and mechanical engineering, medicine, physiotherapy, and dentistry. Individuals can have a high score in space relations and not be good at art; however, a good art student would normally have a high score in space relations. This aptitude is not a measure of artistic creativity.

5. Mechanical Reasoning

This test measures the ability to understand basic mechanical principles of machinery, tools, and motion. Each item consists of a pictorially presented mechanical situation and a simply worded question. Items require reasoning rather than special knowledge.

Example: When the handle is moved in the direction of the arrow, in which direction will the paddle turn, A or B.

Those who do well in this test find it easy to learn how to repair and operate complex devices. Occupations such as carpenter, mechanic, engineering, electrician, physics, chemistry, and machine operator are among those that require good mechanical reasoning.

6. Clerical Speed and Accuracy

This test measures the ability to compare and mark written lists quickly and accurately. This test may predict success in certain kinds of routine clerical tasks, such as filing and coding. Good scores are also desirable for certain jobs involving technical and scientific data.

Example: The following list is given to the student. The list is then repeated on the answer sheet. The student is instructed to mark off the underlined combination on a separate answer sheet.

A <u>AB</u> AC AD Ae AF

B aA aB Ba BA <u>Bb</u>

C A7 7A B7 <u>7B</u> AB

This aptitude tests can also be used to predict hand eye coordination and is carried out under strict time conditions. A high score can be useful in areas such as secretarial work, administration, pilot, computing, accounting, and finance related areas.

Procedure

With eight independent tests, each having its own administration and norms, also reliable, these tests are simple and easy to administer. All the tests should be given in a relatively short span of time, preferably within a two week period. In order to obtain meaningful scenes on the tests, it is necessary that the administrators adhere to the standardized time limits. These tests can be scored either by hand or by use of an IBM test scoring machine.

The Differential Aptitude Test (DAT) are primarily counselling instruments. The evaluation of an individual's scores for guiding purposes involves consideration of both his general level of ability and irregularities in his performance from one test to another.

Results

The tests conducted will be scored as per the DAT manual and interpreted.

Reference:

Bennett K. George, Seashore G. Harold, and Wesman G. Alexander, "Differential Aptitude Tests". The Psychological Corporation, New York, 1959.

EXPEREMENT -6

DAVID`S BATTERY OF APTITUDE TEST

A Retrospective: Psychological testing began, it will be re-called, with efforts to device scientific instruments for the measurements and study of individual differences in intelligence. Measurement and analyses of this complex mental process has continued to be the most important and widespread type of psychological testing. It is desirable, therefore, to examine the definitions and theories of intelligence both for their historical value and their current significance in test construction and utilization.

The methodology for measuring mental ability stands at the crossroads between the traditional, clinical, empirical mode of development and the increasingly favoured psychometric approach. In the past investigators developed certain tests to measure intelligence according to their preconceived notions of what functional ability really meant to them. Those who defined ability as the activity to learn, developed various tests to measure this quality Similarly, those who regarded ability as synonymous with intelligence. In constructed reasoning problems and tasks to evaluate intelligence in this way ability tests developed into many categories of empirically assembled tasks organized according to various operational definitions of this psychological phenomenon.

To define this phenomenon we can say that ability is the actual power to perform an act, physical or mental, whether or not attained by training and/or education. Generally ability is concerned with all sorts of tasks, but specially those of a cognitive or intellectual nature. Special ability has to do with a defined kind of tasks. Each special ability should, whenever possible, be so defined as not to overlap with other special abilities. Ability thus implies that the task can be performed now, if the necessary external circumstances are present; no further training is needed. To compare ability with similar phenomenon it is seen that:

Aptitude: (Which formerly carried implications of innateness) has now been specialized in technical writing to refer to the fact that the individual can be brought by a special amount of training to a specified level of ability either general or special but usually the latter.

Capability: is the maximum effectiveness a person can attain with optimum training

Capacity: is a loose synonym for ability or even or aptitude, often with implications of innateness.

Talent: is a high degree of ability or of aptitude.

Gift and endowment: are popular terms for high ability largely innate.

Competence is fitness either for a particular kind of task or fitness in general.

Various theories have come up in the past few decades to highlight the different methodologies to be accepted for measuring differential abilities. Among the most prominent ones is that of group factor theories. Such theories were originally conceived by Thurstone whose work resulted in the construction of a set of measures called Tests of Primary Mental Abilities

Followed by Spearman's two factor theory of intelligence Cattell's fluid and crystallized intelligence are worth mentioning. J.P. Grilford's structure of intellectual model (SI) which classifies human intelligence into three dimensions.

Perhaps the most important application of factor-analytic studies of mental abilities has been the increasing use of 'multi-aptitude test batteries in educational and vocational guidance.

One such battery is the Differential Aptitude Test (DAT) for use with high school students. The DAT contains seven subtests that measure verbal reasoning, numerical ability, abstract reasoning, space relations, mechanical reasoning and clerical speed and accuracy and language usage. However, DAT and other such batteries which currently exist do not intend to be "Pure" measures of single factors. They just provide a profile of an individual's mental strengths and weaknesses. Therefore, taking this aspect into consideration test/battery of tests was essentially required which could delineate specific abilities based on current occupational/vocational needs and life-styles.

Thus, the stimulus for the development of David's Battery of Differential Abilities (DBDA) came largely from the growing realization that, although most of the primary ability traits had been isolated and studied, the available standardized test batteries of intelligence and abilities did not reflect currently accepted views of the number and nature of the psychological constructs involved. The overall guiding principal in the development of the DBDA was to provide a battery of short tests so as to provide investigators with an economical vehicle for assessing a wide range of the important ability constructs.

Thus, keeping the above concept in mind, the David's Battery of Differential Abilities (DBDA)-Revised version is devised in order to have an accurate measure of an individual's various mental abilities.

Abilities measured in DBDA-R

1) Verbal Ability (VA): Verbal ability refers to the comprehension of words and ideas. a person's ability to understand written language. VA is assessed by two different kinds of sub-tests: Vocabulary (VA - Part 1) and understanding proverbs (VA part-II).

2) Numerical Ability (NA): Numerical Ability refers to facility in manipulating numbers quickly and accurately, manipulation, division, squaring, dealing with fractions, etc. NA is distinct from both reasoning and mathematical knowledge, and is with the more basic trait of facility and fluency in fundamental number of operations, sharing

3)Spatial Ability (SA): Spatial ability is concerned with perceived spatial patterns accurately, and following the orientation of figures when their position in a plane or space is altered.

4) Closure Ability (CA): Closure Ability is primarily a perceptual ability measured by the DBDA. It refers to the ability to see quickly a whole stimulus when parts of it are missing, or to "complete the Gestalt. The Principle of closure has been adopted from Gestalt psychology, which says that the brain tends to fill in gaps in order to perceive complete meaningful forms.

5) Clerical Ability (CL): Clerical Ability is perceptual activity Primarily concerned with making rapid evaluations of features of visual stimuli in CL.

6) Reasoning Ability (RA): Reasoning Ability refers to the ability to apply the process of induction or to reason from some specific information to a general principle.

7) Mechanical Ability (MA): Mechanical Ability refers to an understanding of basic mechanical principles, simple machines, tools, electrical and automotive facts.

8) Psycho-Motor Ability (PM): Psycho-motor Ability refers to precise movement requiring eye-hand coordination under highly speeded conditions. PM ability can be considered one of five-musele dexterity, primarily manual

Administration of the battery of Tests:
The instructions for administration of each test of DBDA-R are given specifically and details of time to be given to complete each of sub-tests are given below:

Working Time and Number of items in Each Test

S. No	Test	Work Time	No. of items
1	VA Part I	4 mts	15
	Part II	3 MTS& 30 seconds	9
2	NA	5 MTS& 30 seconds	20
3	SA	6 mts	72
4	CA	5 mts	20
5	MA	9 mts	25
6	CL	3 mts	72
7	RA	5 mts	12
8	PM	5 mts	70
Note	Time not to be disclosed to the subject.		

Applications of DBDA-R Results
The uses of aptitude/ability test results fall into two general categories (a) counselling with individuals, and (b) in making administrative decisions about individuals or groups. It is important to keep these two uses separate whenever they are applied in schools, industry, business, social agencies or elsewhere. Both functions, however require quite similar kinds of information.

(Scoring Interpretation and for further details DBDA-R Manual need to be referred.)

Reference
Sanjay Vohra (1994) Handbook for DBDA (Revised), Pxy-Com services, New Delhi

EXPEREMENT -7

THURSTONE INTEREST INVENTORY

Introduction:

The Thurstone Interest Schedule is a check list by which a person can systematically clarify his understanding of his vocational interests. It is designed as a counselling instrument to be used in situations in which the client-counsellor relationship is such that straight forward and honest expression of choices can be expected. It is not a test and its purpose is not disguised.

Among its features are brevity and ease of scoring.

This Vocational interest Schedule requires less than ten minutes of the subject's time. It gives a profile of ten scores. The scoring requires no stencils and takes only two or three minutes. The schedule consists of a single sheet of paper, 11 x 17 inches in the form of a 4 pages folder. On the double inside page is printed a large rectangle divided into ten rows and ten columns. In each of the one hundred spaces or boxes, there is printed a pair of occupations and the subject is asked to mark his preference in each box. The ten scores in the profile represent relative interest in ten vocational fields. There are:

PS - Physical Science

BS - Biological Science

C - Computational

B - Business

E - Executive

P - Persuasive

L - Linguistic

H - Humanitarian

A - Artistic

M - Musical

Each of the ten occupational fields is compared twice with each of the other fields. In this manner the ten scores are directly comparable. The pairs of occupations are so arranged that the first items in any column represent the same field. Similarly, the second items in any row represent the same field. This arrangement makes the scoring very simple.

Aim:

To measure an individual's vocational Interests.

Materials:

Thurstone Interest Schedule Manual, Scoring Key.

Procedure:

After the subject is seated comfortably at his seat he was given Thurstone Interest Schedule and the following instructions were given "Here you see pairs of vocational fields you are requested to mark your preference for each pair. You are encouraged to mark both items in a pair if you like both of them. If you do not like both Items, you are allowed to cross them out". To mark the one hundred pairs seldom requires more than ten minutes, and usually less.

Scoring:
The schedule can be scored either by the experimenter or by the subject. The scoring is done by counting the number of marks in each column and its corresponding row. The comparison items are arranged so as to facilitate scoring without interefeence of printing across the column or row. The score is then recorded for each of the ten fields. The range for each score is 0 to 20.

Results:
Table I: Shows the individual data of Thurston Interest Schedule.

Vocations	Score
PS - Physical Science BS - Biological Science C - Computational B - Business E - Executive P - Persuasive L - Linguistic H - Humanitarian A - Artistic M - Musical	

Table II: Shows the group data on Thurstone Interest Schedule.

S. No	Name of the Subject	Most preferred Vocation	Least Preferred Vocation
1 2 3 4 5 6 7 8 9 10			

Discussion: The points to be discussed are:
(a) The subjects score in each of the ten occupational fields.
(b) The subject's tendency on the group.
(c) Comparatively which subject in the group scored high and low-discuss.
(d) In which occupational field of the Inventory does the subject need counseling?

Conclusions:
(A) The subject's overall scores on 10 occupational fields and the need for counseling.
(B) Scores on the group with low and high scores.

Reference:
L.L. Thurstone, Thurstone Interest Schedule "The Psychological Corporation, New York 17,N.Y. 1921.

EXPEREMENT - 8
CONCEPT FORMATION

Introduction

A concept is a general idea that stands for a general class and represents the common characteristic of all objects or events of this general class. Concepts are indispensable in thinking. Classification of objects is done on the basis of concepts. Concepts are mental categories for objects, events, experiences or ideas that are similar to one another in one or more respects. Concepts play a central role in our task of understanding the world around us and representing it mentally. Conceptual thinking takes less time. Concepts, as a tool, economize the efforts in thinking. Concepts extend the limits of thinking to include both the past and the future. Concepts allow us to represent a lot of information about diverse objects, events or ideas in a highly efficient manner.

Characteristics of Concepts

1. What distinguishes man from animals is his ability to form concepts. Concepts are very important tools of thinking. They guide our thinking. If the concepts are wrong, then our thinking would be faulty. If the concepts formed are objective, only then our thinking would be correct.

2. Concepts allow economy in reasoning and problem solving. Some of the most generalized and definite concepts (such as triangularity, square, energy) are applied in higher mathematics and symbolic logic. It saves much of physical and mental energy. It is easier and more economical to use general ideas than to deal with each individual object.

3. Concepts play a central role in our task of understanding the world around us and representing it mentally.

4. The human ability to form concepts enables us to classify things into categories. The features we select define the concept and form the basis for making classifications. When a classification has been made, we tend to behave toward and think about member of the class in similar ways. Thus, such concepts are ways of classifying the diverse elements in the world around us. They are convenient tools to use in thinking about the world and in solving problems. Most of our knowledge is in the form of concepts, rather than independent, specific items or instances.

5. We learn to simplify and provide order to our world of events, objects etc. Concepts allow us to mentally group things that share certain features even though they are not identical.

6. A concept may represent a category to which all varieties of one kind of physical object belong. For example, our concept of car encompasses every thing from a Maritime to Rolls Royce.

7. Concept also represents:
   a. Kinds of living things (dog or person).
   b. Types of activities (reading or jogging),
   c. Physical properties (square, little),

d. Relationships between things (taller than, prettier than),
e. Abstract cognitive states (good, love, morality).

8. There seems to be an optimal or basal level in each concept hierarchy that we naturally use where we think about objects or events. When subjects are shown a picture of an object and are asked to verify (yes or no) that it illustrates a particular concept, they tend to react fast at the basic level. e.g. when shown a picture of a kitchen chair, subjects consistently classify it more quickly at the basic level (chair) than at either a subordinate level (kitchen chair) or a super-ordinate level (piece of furniture).

A concept is defined as a common property among all objects or events of a given category. It is a fundamental step in higher forms of thinking. The process by which we discover features which are common to a large number of objects and associate these with a symbol, which thereafter may be applied to other similar objects, is called concept formation. Concept formation involves:

- Abstraction
- Generalization

Haufmann and Kasanin developed a test to study concept formation. In this test the subjects' task is to sort out the presented blocks into four classes and to formulate and specify the bases of classification. It is clear that this test calls for a wide variety of reactions. It involves trial and error kind of problem solving in which the subject tries to correct reactions. It also includes reasoning type of problem solving wherein that subject assumes an abstract attitude and proceeds with the solution. Any subject who has a mental difficulty because of brain injury or schizophrenia will experience difficulties with this experiment.

Problem:
To study the process of concept formation.

Materials Required:
- Haufmann Kasanin Concept Formation apparatus consisting of 22 wooden blocks of different colors, shapes, height, and sizes.
- Stop clock

Subject Particulars:

Name :

Age :

Sex :

Procedure:
The subject is seated comfortably in front of the apparatus. 22 wooden blocks are displayed in a semi circle on the table.

The following instructions are given to the subject: "Here are a number of blocks of different sizes, color, height and shape. Classify them into four groups using any principle. Do not turn the blocks, only move them. After grouping them indicate the basis on which you have grouped them".

The time taken and criteria used for each trial is noted. After each trial the subject's classification is checked and the blocks incorrectly classified are shown to the subject. The blocks are then reshuffled and the subject is asked to try again. The subject is given as many trials as required till successful classification. An introspective report is taken from the subject.

Precautions:

- Care should be taken to see that the letters printed below each block are not visible to the subject.
- The subject should not be allowed to lift the blocks at any time.
- The criteria for classification should be noted down correctly.

Results:

The responses of the subject for concept formation are shown in Table1.

Table 1 showing the responses of the subject

Trials	Concepts used	Time taken	Success/Failure
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Discussion:

State the number of trials taken by the subject. State the changes in time taken for each trial. Discuss the criteria used for classification. Discuss the method used by the subject to form the right concept.

Conclusion:

The process of concept formation was studied.

EXPEREMENT -9
PROBLEM SOLVING

Introduction
The word 'problem' can describe events as diverse as learning e.g., to tie your shoes, figuring out how to get an appointment with a consultant, thinking of an eight-letter word that means the banishment of an evil spirit, trying to rearrange the furniture in your room, and reducing the threat of nuclear war in the world. Everyday we solve hundreds of small problems, and in the process we learn routine actions for handling those that recur. The solutions become automatic and we no longer consider ourselves to be "solving problems". Only when an established routine fails to do, we begin to think again about familiar problems. Getting to school poses no problem unless your car or bike breaks down and the buses are on strike. Fixing a dinner is no challenge unless a power failure turns off all your appliances.

These problems are everyday puzzles, others such as repairing a stereo, requires expertise and still other problem solving activities are undertaken as source of entertainment such as the mystery readers want to be a step ahead of the novel's skilled detective and solve the murder before. the solution is revealed by the author. Jigsaw puzzles, jumbles etc. form hobbies for some people who find them interesting because of their problem solving aspects of those activities. The beaucrates have to solve the problems of their employees in their files after taking quick decisions.

Definitions
Hilgard (1953) "Whenever goal oriented activity is blocked, whenever a need remains unfulfilled, a question unanswered, perplexity unrelated, the subject faces a problem."

Woodworth Schlosberg "A Problem exists where subjects activity has goal but no clear or well learned route to the goal. He has to explore and find route."

D.M. Johnson (1972) "When a person is motivated to reach the good, bus fails in the first attempt to reaching the goal, the problem arises for the person i that situation."
Stages in Problem Solving

Psychologists have viewed problem solving as a process of various stages The stages of problem solving according to Graham & Wallas are as follows:-

(a) Preparation:
The initial, preparation stage of problem solving involves a great deal of information gathering, including an assessment that requires a clear definition of the problem. What is the problem What are its starting and end points ? What seem to be the obstacles? What kinds of information are needed to work toward a solution ? If a problem seems familiar, reproductive thinking might lead to the conclusion that a previously successful solution may be successful. Research has shown that one of the strengths of expert problem solvers is that they can draw on their considerable experience to generate reproductive solutions.

(b) Incubation:
Incubation stage is present some times only. Incubation occurs when the problem has been put aside i.e. when the individual stops thinking about the problem and engages in some other activity. During this incubation period the solution may appear suddenly, or a new approach

may become apparent. This may occur because incubation period allows the person to recover from the mental fatigue that has built up from working on the problem. But in many incubation instances, solutions to the problems do not appear.

(c) Production:
Production involves thinking of problem solutions. In this stage, Potential solutions begin to be generated. Various strategies are employed to find out the correct solution such as trial and error, Algorithm-A rule that guarantees solution to a specific type of problem, heuristics-rule of thumb or quick-fix methods mean end analysis-breaking a problem into sub-goals that can be reached by smaller problems and working back ward solving a problem by working backward from the goal. Employing all or one strategy often leads to the solution of the problem.

(d) Evaluation:
In this stage, the solution is evaluated in terms of its ability to satisfy the demands of the problem. If it meets all the criteria, then the problem is solved. If not then the person goes back to the production stage to generate additional solutions. In some cases, several solutions may be generated, all of which solve the problem. Yet some solutions may be better than others that is, they are cost efficient, involves less time, are more humane, and so forth. These alternate solutions are compared at the evaluation stage.

Aim:
To measure the problem solving ability of the subject.

Materials used
Problem solving consumable Booklet, scoring key timer and manual.

This Test is Constructed by L.N Dubay (Jabalpur), and published by *National Psychological Corporation Agra.* It consists of 20 Questions.

Procedure

- The subject is seated in a position the following instructions are given.
- On the following pages 20 problem based statements have been given & for each of the problem staternent Four alternative answers have been given.
- Kindly carefully study each problem statement and corresponding Four alter-native answer and the answer alternative which you think is correct, put a tick mark in the cell meant for it.
- Please do try to answer all the 20 questions.
- This is not an examination and the result on this scale is not going to affect your academic examination.

Be rest assured your answers will be kept confidential. The Time for Attempting this scale is 20 minutes. So work fast.

Results

Table 1

Raw Score	z-Score	Grade	Level of Problem Solving Ability

Table 2

S.No	Name of the Subject	Grade	Level of Problem Solving Ability

Discussion

The points to be discussed

1. Individual subject grades and their level of problem ability.
2. The level of problem solving ability of the group members.

EXPERIMENT- 10
REASONING

Introduction
Psychology experiments and aptitude tests use various types of reasoning questions to assess cognitive abilities, problem-solving skills, and fluid intelligence. These typically fall into **verbal, numerical, abstract, inductive, and diagrammatic reasoning** categories.

Here are examples of the types of questions found in reasoning experiments and tests:

Abstract and Inductive Reasoning
These tests require you to identify patterns and logical rules in unfamiliar, non-verbal content, typically sequences of shapes or matrices, to determine a missing item or the next item in the sequence.

Sequence Completion: Which of the boxes comes next in the sequence? (The user would be presented with a sequence of 4-5 images and options A-E for the next one). The task is to identify the underlying rule governing the changes in the sequence (e.g., rotation, color inversion, addition of elements).

Matrix Completion: A 3x3 grid of figures is shown with one missing square. You must determine the pattern across rows and down columns to select the correct missing figure from the options. (Ravens Progressive Matrices is a well-known example of this type of assessment).

Verbal Reasoning
Verbal reasoning questions assess your ability to understand and interpret written passages and use the information provided to evaluate statements.

True/False/Cannot Say: You are given a short passage of text, followed by a statement. You must decide if the statement is True (must be true based only on the passage), False (must be false based only on the passage), or Cannot Say (cannot be determined without further information). The key is to use only the provided information.

Numerical Reasoning
These tests evaluate your ability to deal with mathematical problems and data presented in tables or graphs.

Word Problems: "In a restaurant, there are 7 choices for dresses, 8 choices for shoes, and 7 choices for necklaces. How many different outfit combinations are possible?".

Data Interpretation: You might be presented with a graph showing sales figures over several months and asked a question that requires calculation or interpretation of the data (e.g., percentage increase, average sales).

Deductive Reasoning
Deductive reasoning involves using given facts or premises to reach a logically certain conclusion.

Syllogisms: A classic example involves a major premise, a minor premise, and a conclusion.

Premise 1: All famous sports players are footballers.

Premise 2: All footballers are fit and healthy.

Conclusion: Therefore, all famous sports people are fit and healthy.

The task is to determine if the conclusion is logically valid based only on the premises provided, even if the premises themselves aren't true in the real world.

The Psychology reasoning test use questions like "odd one out, analogies, series, blood relations, coding – decoding, cause – effect data sufficiency, assessing critical thinking analytical skills and lateral thinking to find patterns and logical conclusions under timed conditions with examples from the Aptitude test".

Common reasoning topics includes blood relation calendars clocks etc.

The sample logical reasoning test is given below.

Directions for questions 1 to 5: Read the following passage below and solve the questions based on it.

There are seven professors A, B, C, D, E, F and G teaching seven subjects History, Geography, Physics, Chemistry, Maths, Biology and English from Monday to Friday at Gaya College. Each professor teaches a different subject and not more than two subjects are taught on any one of the days.

(i) Chemistry is taught by professor B on Tuesday.

(ii) Professor D teaches on Friday but neither Geography nor Physics.

(iii) Professor F teaches History but neither on Thursday nor on Friday.

(iv) Professor A teaches English on the day on which History is taught.

(v) Professor C teaches Maths on Monday.

(vi) Geography and Chemistry are taught on the same day.

(vii) Professor G teaches on Thursday.

1. On which of the following days is English taught?
(a) Wednesday
(b) Monday
(c) Tuesday
(d) Cannot be determined

2. Which of the following subjects is taught by professor G?
(a) Biology (b) Geography
(c) Physics (d) Chemistry

3. On which of the following days is Geography taught?
(a) Monday (b) Tuesday
(c) Wednesday (d) Thursday

4. Which subject is taught on Friday?
(a) Physics (b) History
(c) Geography (d) Biology

5. Which of the following pairs of professors teaches on Tuesday?
(a) B and D (b) A and B
(c) B and F (d) None of these

Directions for questions 6 to 10: Read the information given below and solve the questions based on it.

K, L, M, N, P, Q, R, S, U and W are the only ten members in a department. There is a proposal to form a team from within the members of the department, subject to the following conditions:

- A team must include exactly one among P, R, and S.
- A team must include either M or Q, but not both.
- If a team includes K, then it must also include L, and vice versa.
- If a team includes one among S, U, and W, then it must also include the other two.
- L and N cannot be members of the same team.
- L and U cannot be members of the same team.
- The size of a team is defined as the number of members in the team.

6. Who cannot be a member of a team of size 3?
(a) L (b) M
(c) N (d) P
(e) Q

7. Who can be a member of a team of size 5?
(a) K (b) L
(c) M (d) P
(e) R

8. What would be the size of the largest possible team?
(a) 8 (b) 7
(c) 6 (d) 5
(e) cannot be determined

9. What could be the size of a team that includes K?
(a) 2 or 3 (b) 2 or 4
(c) 3 or 4 (d) Only 2
(e) Only 4

10. In how many ways a team can be constituted so that the team includes N?
(a) 2 (b) 3
(c) 4 (d) 5
(e) 6

11. If X is the brother of the son of Y's son, how is X related to Y?
a) Grandson b) Son
c) Cousin d) Cannot be determined

12. Amit introduces Rahul as the son of the only brother of his father's wife. How is Rahul related to Amit?
(a) Cousin (b) Son
(c) Uncle (d) Son-in-law

13. A + B means A is the mother of B A – B means A is the brother B
A @ B means A is the father of B and A × B means A is the sister of B,
Which of the following shows that P is the maternal uncle of Q?
(a) Q – N + M × P (b) P + S × N – Q
(c) P – M + N × Q (d) Q – S @ P

14. A + B means A is the sister of B A – B means A is the brother of B

A × B means A is the daughter of B.
Which of the following options show that E is the maternal uncle of D?
(a) D + F – E (b) D – F × E
(c) D × F + E (d) None of these

15. Introducing a boy, a girl said, "He is the son of the daughter of the father of my uncle." How is the boy related to the girl?
(a) Cousin (b) Nephew
(c) Uncle (d) Son-in-law

16. Neha Kavi moved a distance of 75 metres towards the north. She then turned to her left and walked for 25 metres, turned left again and walked 80 metres. Finally, she turned to the right at an angle of 45º. In which direction was she moving finally?
(a) North-east (b) North-west
(c) South (d) South-west

17. One day, Dileep left his home and walked 10 km southwards, turned right and walked 5 km, turned right and walked 10 km, walked left and then walked 10 km. How many kilometres will he have to walk to reach his home straight?
(a) 10 km (b) 15 km
(c) 20 km (d) 25 km

18. Tanay is standing facing north. Turning to his right, he walks 25 metres. He then turns to his left and walks 30 metres. He, further, walks 25 metres to his right. He then walks to his right again and walks 55 metres. Finally, he turns to the right and walks 40 metres. In which direction is he now from his starting point?
(a) South-west (b) South
(c) North-west (d) South-east

19. Kaveri walks 10 km towards North. From there she walks 6 km towards South. Then, she walks 3 km towards East. How far and in which direction is she with reference to her starting point?
(a) 10km Northwest (b) 6km Southwest
(c) 5km Southwest (d) 5km Northeast

20. Gyan Prakash left for his college in his car. He drove 15 km towards north and then 10 km towards west. He then turned to the south and covered 5 km. Further, he turned to the east and moved 8 km. Finally, he turned right and drove 10 km. how far and in which direction is he from his starting point?

(a) 2 km West (b) 5 km East
(c) 3 km North (d) 6 km South

Directions for questions 21 to 25: Read the following passage and solve the questions based on it.

Amit, Bharat, Chandan, Dinesh, Eeshwar and Ferguson are cousins. None of them are of the same age, but all of them have birthdays on the same date. The youngest of them is 17 years old and Eeshwar, who is the eldest, is 22 years old. Ferguson is somewhere between Bharat and Dinesh in age. Amit is elder to Bharat and Chandan is older than Dinesh.

21. Which of the following is not possible?

(a) Dinesh is 20 years old
(b) Ferguson is 18 years old
(c) Ferguson is 19 years old
(d) Ferguson is 20 years old

22. If Bharat is 17 years old, then which of the following could be the ages of Dinesh and Chandan respectively?

(a) 18 and 19 (b) 19 and 21
(c) 18 and 20 (d) 18 and 21

23. If two of the cousins are between Chandan and Ferguson in age, then which of the following must be true?

(a) Amit is between Ferguson and Dinesh in age
(b) Bharat is 17 years old
(c) Bharat is younger than Dinesh
(d) Ferguson is 18 years old

24. If Amit is one year elder to Chandan, the number of logically possible orders of all six cousins by increasing age is

(a) 2 (b) 3
(c) 4 (d) 5

25. If Chandan is 19 years old, which of the following must be true?

(a) Amit is 20 years old and Dinesh is 21 years old
(b) Bharat is 18 years old and Amit is 20 years old
(c) Bharat is 20 years old and Amit is 21 years old
(d) Dinesh is 17 years old and Bharat is 21 years old

Directions for questions 26 to 29: Read the following passage and solve the questions based on it.

The Hotel Leela in Goa has two wings, the East wing and the West wing. Some East wing rooms, but not all, have an ocean view. All the West wing rooms have a harbor view. The charges for all the rooms are the same, except:

(i) There is an extra charge for all harbour view rooms on or above the third floor.

(ii) There is an extra charge for all ocean view rooms, except those without a balcony.

(iii) Some harbour view rooms on the first two floors and some East wing rooms without an ocean view have kitchen facilities, for which there is an extra charge.

(iv) Only the ocean view and the harbour view rooms have balconies.

26. A guest can avoid an extra charge by requesting:

(a) a West wing room on one of the first two floors
(b) a West wing room on the fourth floor without a balcony
(c) an East wing room without an ocean view
(d) an East wing room without a balcony

27. Which of the following must be true if all the conditions are as stated?

(a) all rooms above the third floor involve an extra charge
(b) no room without an ocean or a harbour view or kitchen facilities involves an extra charge.
(c) there is no extra charge for any East wing room without an ocean view
(d) there is no extra charge for any room without kitchen facilities.

28. Which of the following must be false if all the conditions are applied?

(a) some ocean view rooms do not involve an extra charge
(b) all rooms with kitchen facilities involve an extra charge
(c) some West wing rooms above the second floor do not involve an extra charge
(d) some harbour view rooms do not involve an extra charge

29. Which of the following cannot be determined on the basis of the information given?

I. whether there are any rooms without a balcony for which an extra charge is imposed
II. whether any room without a kitchen or a view involves an extra charge
III. whether two extra charges are imposed for any room

(a) I only
(b) II only
(c) I and III only
(d) II and III only

30. The CEO of a company must appoint a committee of 5 persons from different fields to serve as committee members. He must select two MBAs from A, B and C and three Engineers from F, G and H.

(i) Both B and H, cannot be appointed in the committee.
(ii) Both G and F, cannot be appointed in the committee.
(iii) Both E and H, cannot be appointed in the committee.

If C is not selected in the committee then any of the following could be in the committee except

(a) D (b) H
(c) E (d) G

Directions for questions 31 to 32: Read the following passage and solve the questions based on it.

(i) Seven friends P, Q, R, S, T, U and W have gathered at the Patna airport. However,

only five of them are scheduled to go to five different places Delhi, Chennai, Lucknow, Bangalore and Kolkata.

(ii) Five of them are executives with specializations in Administrative (Admn), Human Resource Management (HRM), Marketing, Systems and Finance.

(iii) T is an executive and he is going to Chennai and his specialization is neither Finance nor Marketing.

(iv) W is a system specialist and is going to Delhi. U is an executive but is not going anywhere.

(v) Q is an executive with specialization in HRM but has come at the airport to see his friends only.

(vi) P is an executive but not from Marketing and is going to one of the destinations but not to Bangalore or Kolkata.

31. Who among the following specializes in Marketing?
(a) S (b) P
(c) U (d) Cannot be determined

32. What is the specialization of R?
(a) Finance
(b) Marketing
(c) Either Marketing or Finance
(d) None of these

Directions for questions 33 to 34: Read the following passage and solve the questions based on it.

(i) Six men B, D, C, M, J and K are split in two groups of three each and are made to stand in two rows, such that a man in one row is exactly facing a man in the other row.
(ii) M is not at the ends of any row and is to the right of J, who is facing C. K is to the left of D, who is facing M.

33. Which of the following groups of men are in the same row?
(a) BMD (b) MJK
(c) BDC (d) None of these

34. Who is to the immediate left of B?
(a) M (b) D
(c) J (d) Data inadequate

Directions for questions 35 to 37: Read the following passage and solve the questions based on it.

A, B, C, D, E, F and G are seven persons who travel to office everyday by a particular train which stops at five stations 1, 2, 3, 4 and 5 respectively after leaving its base station.

(i) Three among them get on the train at the base station.

(ii) D gets down at the next station at which F gets down.

(iii) B does not get down either with A or F.

(iv) G alone gets on at station 3 and gets down with C after having passed one station.

(v) A travels between only two stations and gets down at station 5.

(vi) None of them gets on at station 2.

(vii) C gets on with F but does not get on with either B or D.

(viii) E gets on with two others and gets down alone after D.

(ix) B and D work in the same office and they get down together at station 3.

(x) None of them get down at station 1.

35. At which station does E get down?
(a) 2 (b) 3
(c) 4 (d) Cannot be determined

36. At which station do both C and F get on?
(a) 1 (b) 2
(c) 4 (d) None of these

37. At which of the following stations do B and D get on?
(a) 1 (b) 2
(c) 3 (d) Cannot be determined

Directions for questions 38 to 40: Read the following passage and solve the questions based on it.

A business school publishes three issues of their research Journal in a year. The editor decided that the upcoming three issues April, August and December would carry articles written by seven of the most reputed professors of the school. Each of the seven authors (T, U, V, W, X, Y and Z) will have at least one article published but some may have more than one article published. The following restrictions apply to the publication of the articles:

(i) Each of the issues being prepared must contain at least two articles.

(ii) Only these seven professors' articles can appear in the upcoming April, August and December issues.

(iii) No author may publish in each of the two consecutively published issues or twice in the same issue.

(iv) If an article written by T appears in an issue, then an article written by U must also appear in that issue.

(v) If an article written by W appears in an issue, then an article written by Y must appear in the immediately preceding issue.

(vi) An article written by Y cannot be published in an issue that contains an article written by Z.

38. If the April issue consists exclusively of articles written by T and U, then the August issue can consist exclusively of

articles written by which of the following group of authors?
(a) V and X (b) V and Y

(c) W and Z (d) V, Y and Z

39. If the April issue consists exclusively of articles written by U, V and Z, then the August issue must contain an article written by which of the following authors?
(a) W (b) X
(c) Y (d) Z

40. If the December issue consists exclusively of articles written by U, V and W, then the August issue must have consisted of articles written by which of the following groups of authors?
(a) T and Z (b) U and Y
(c) X and Y (d) X and Z

ANSWERS

1.	(a)	**2.**	(c)	**3.**	(b)	**4.**	(d)	**5.**	(d)
6.	(a)	**7.**	(c)	**8.**	(d)	**9.**	(e)	**10.**	(e)
11	(a)	**12.**	(a)	**13.**	(c)	**14.**	(d)	**15**	(a)
16.	(d)	**17.**	(b)	**18.**	(d)	**19.**	(d)	**20.**	(a)
21.	(d)	**22.**	(b)	**23.**	(d)	**24.**	(a)	**25.**	(c)
26.	(d)	**27.**	(b)	**28.**	(c)	**29.**	(a)	**30.**	(b)
31.	(c)	**32.**	(d)	**33.**	(d)	**34.**	(a)	**35.**	(c)
36.	(d)	**37.**	(d)	**38.**	(b)	**39.**	(c)	**40.**	(c)