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INDEX

TEST AND MEASUREMENT

Introduction :

Test, Measurement and Evaluation :

* Test and measurement help the teacher to measurement the pupil's learning. So we can say that test and examinations at the instrument to measure the pupil progress in leaning. We have several name, standard etc. which all tell us abart the programme made by the pupil.

Types of Test :

* A methematics teachers like other teachers must prepare and administer test periodically to measure progress of the students. Any teacher must be aware the principle of the test construction.

* Diagnostic test
* Achievement test
* Aptitude test

Diagnostic test :

* The purpose of the test is to diagnose students difficulties in the acquisition of the number all ability.

* The diagnostic test will serves to the teacher difficulties to the students for example students may have some difficulty in fundamental questions.

* The difficulties to the students can be defeated by diagnostic test according to semainant teaching may planned.

Achievement Test :

* Achievement test can be considered in opposite of aptitude test because the test is conducted at the course.

* The purpose of students with reference can be mathematical calculations in other word we can say that it is an achievement.

Aptitude Test :

* usually this that is conducted at the beginning of a course are the objectives to be found out for the student progress necessary knowledge and skill.

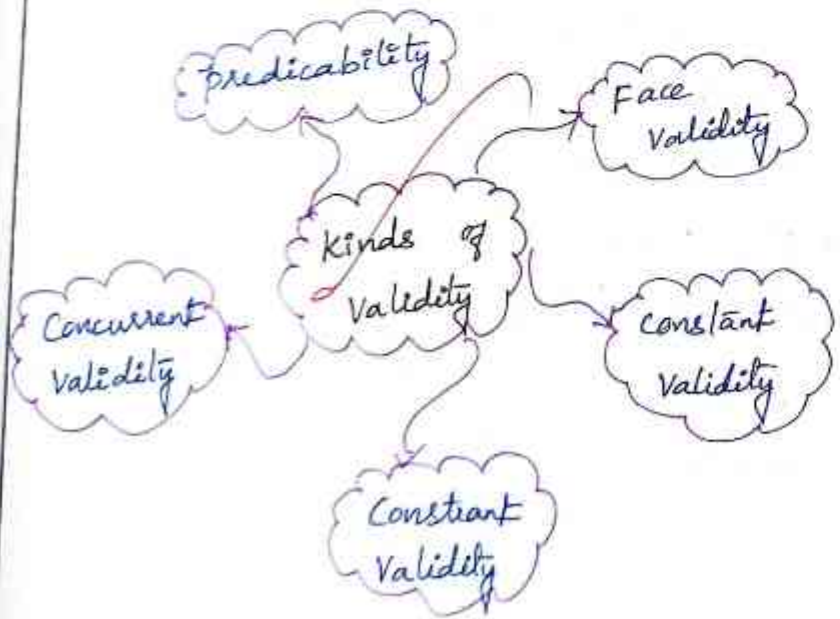
* For example a student who would not calculate a simple problems.

* properly could not get any benefit from a course on mathematics.

characteristics of a Good test:

* The test conducted by the teacher should test write on essay of photographs as the arts, because the questions test not only the test but also the writing ability, but also advanced knowledge about photographs, and also but the following questions may be valid to the test the writing ability.

* There are several kinds of validity.



i) Face Validity :

* A questions paper for a subject must appear to be relevant for the subject, for example science test paper must appear in the form of equations and formulas.

ii) Concurrent validity :

* It refers to the ability of the test to predict one future success the student will regard to problem solving skill.

iii) Reliability :

* A test is reliability if it yield the same results when it is conducted by administration on difficult occasion. These are different method in make test reliability.

Method :1

* Two test which are similar in all respects if the result of both the test are reliable. This, method is generally not used because two similar cannot easily prepared.

Method :2

Test method :

* This is usually produced, it can same the reliabileties. Hence, the test half continue all the old numbered questions. The other half contains all the over number questions.

Objectives :

* A test is objectively if different examinar give the same makes to the same answer paper. A test can be make objectives by including objective type questions

* Multiple choice questions
* Match the following
* Fill in the blanks
* True (or) false
* Draw the graphical pictures
* Write the name of the given pictures

*These types of questions are objectives because everyone of them must to calculate difficult problem, moral problems and even simple problem type questions because more solution are poridles.

practicabilety :

* A test must easy to administrate other wise the questions may became relevance. Besides the Validity and Practicabilety it should be practised to admire the fears of time expression etc.

Weightage chart:

* Many questions paper used to test our examinations about be properly weightage by weightage.

⇒ Knowledge
⇒ Comprehension
⇒ Expression
⇒ Appreciation

Content weightage:

⇒ Equations
⇒ Formulas
⇒ Steps
⇒ Problems

Types of Questions weightage:

⇒ objective type
⇒ Short answer
⇒ Paragraph
⇒ Essay.

Scoring key:

* After construction of a test the examiner should necessarily provide scoring key where the questions. The questions has to give expected answer and view the matching should be carried out.

: The test should be constructed based on the blue print prepared.

WEIGHTAGE TABLES

1. TO SKILL :

S.No	Skills	Number of marks obtained	Percentage (%)
1.	Knowledge	20	$\frac{20}{50} \times 100 = 40$
2.	Understanding	6	$\frac{6}{50} \times 100 = 12$
3.	Application	9	$\frac{9}{50} \times 100 = 18$
4.	Analysis	2	$\frac{2}{50} \times 100 = 4$
5.	Synthesis	8	$\frac{8}{50} \times 100 = 16$
6.	Evaluation	5	$\frac{5}{50} \times 100 = 10$
	Total	50	100

2. TO content / unit :

S.No	Unit	Number of marks obtained	percentage (%)
1.	World of microbes	19	$\frac{19}{50} \times 100 = 38$
2.	Genetics	12	$\frac{12}{50} \times 100 = 24$
3.	plant Anatomy	19	$\frac{19}{50} \times 100 = 38$
	Total	50	100

3. TO Question type :

S.No	Question type	Number of marks obtained	percentage (%)
1.	Objective	20	$\frac{20}{50} \times 100 = 40$
2.	Short answer	20	$\frac{20}{50} \times 100 = 40$
3.	Essay type	10	$\frac{10}{50} \times 100 = 20$
	Total	50	100

Blue print

Instructional objectives / Units	Knowledge			understanding			Application			Analysis			synthesis			Evaluation			Total
	O	S.A	E	O	S.A	E	O	S.A	E	O	S.A	E	O	S.A	E	O	S.A	E	
World of microbes	1(8)				2(2)				5(1)		2(1)								19
Genetics	1(6)				2(1)									2(2)					12
plant Anatomy	1(6)							2(2)						2(2)				5(1)	19
	20			6			9			2			8			5			50

1 → one mark
2 → Two mark
5 → Five mark

O → objectives
S.A → Short answer
E → Essay type

KONGUNADU COLLEGE Of EDUCATION,THOLURPATTI

GOVERNMENT HIGHER SECONDARY SCHOOL, KRISHNARAYAPURAM

Class:6. ACHIEVEMENT TEST Mark:50

Subject: SCIENCE Time:1.30 HRS

PART-I

I.CHOOSE THE CORRECT ANSWER : 1*5=5

1. The 'Control Centre' of the eukaryotic cell is .....

A) Cell wall B) Nucleus. C) Vacuoles D) Chloroplast

2. Most organelles in an eukaryotic cell is found in the .....

A) Cell wall B) Cytoplasm C) Nucleus D) Vacuole

3. Main organ of respiration in human body is .....

A) Stomach B) Spleen C) Heart D) Lungs

4. Circulatory system transports these throughout the body.....

A) Oxygen B) Nutrient C). Hormones D).All of these

5. Which one of the following is not an unicellular organism?

A) Yeast B) Amoeba C) Spirogyra. D) Bacteria

II.FILL IN THE BLANKS: 1*5=5

1 The instrument used to observe the cell is .....

2. The term cell was coined by .....

3. Power house of the cell .....

4. The food producer.....

5. A group of organs together make up an ..... System.

III. MATCH THE FOLLOWING: 1*10=10

1. Control center	-	Air sacs
2. Gate of the cell	-	Sound
3. Energy producer	-	Cell membrane
4. Ear	-	Mitochondria
5. Heart.	-	Protection of internal organs
6. Lungs	-	Cardiac muscle

7. Skeletal system - Spirogyra

8. Diaphragm - Nucleus

9. Gate of the nucleus - Flat muscle

10. Unicellular - Nuclear membrane

PART-II

IV. GIVE THE SHORT ANSWER: 10*2=20

1. Who discovered the cell in 1665?
2. What type of cell do we have?
3. What are the essential components of a cell?
4. What are the organelles found only in plant cell?
5. Give any three examples of eukaryotic cell?
6. Which one is called as "Area of movement"?
7. Describe about skeletal system?
8. Write any two functions of digestive system ?
9. Name the important parts of the eye?
10. Name the five important sense organs?

PART-III

V. ANSWER IN DETAIL:

1. Tabulate any five cell organelles and their functions ? 2*5=10
2. List out the functions of the human skeleton?

ANSWER KEY

PART - I

I. Choose the correct Answer :

1. b) Nucleus
2. b) cytoplasm
3. d) Lungs
4. d) All of these
5. c) spirogyra

II. Fill in the blanks :

1. Microscope
2. Robert Hooke
3. Mitochondria
4. chloroplast
5. organ

III. Match the following :

1.	Control center	: Nucleus
2.	Gate of the cell	: Cell membrane
3.	Energy producer	: Mitochondria
4.	Ear	: Sound
5.	Heart	: Cardiac Muscle
6.	Lungs	: Air sacs
7.	Skeletal System	: Protection of internal organs
8.	Diaphragm	: Flat muscle
9.	Gate of the nucleus	: Nuclear membrane
10.	Unicellular	: Spirogyra

PART - II

IV. Give the short answer :

1. Robert Hooke discovered the cell in 1665.

2. Type of cells do we have :

* The human beings has different types of cells. such as,

⇒ Muscle cells

⇒ Stem cells

⇒ Bone cells

⇒ Skin cells

⇒ Cartilage cells etc.

3. Essential components of a cell :

* The following are the essential components of a cell.

⇒ Cell membrane

⇒ Nucleus

⇒ Cytoplasm

4. The organelles found only in plant cell :

* The following are the organelles which are found only in plant cell.

⇒ chloroplast

⇒ cell wall

⇒ vacuole

5. Examples of eukaryotic cell :

⇒ plant cells

⇒ Fungal cells

⇒ Muscle cells

⇒ Cancer cells

⇒ Bone cells

⇒ Stem cells

6. Area of movement :

* cytoplasm is called as area of movement which are moved from one place to another place within the cell through locomotion.

7. Skeletal system :

⇒ Skeletal system is your body's central framework.

⇒ It consists of bones and connective tissue, cartilage etc..

8. Functions of digestive system :

⇒ Digest and absorb food.

⇒ Excrete the waste products

9. Important parts of the eye :

* Iris
* Pupil
* Cornea
* Lens

10. Five important sense organs :

* Skin
* Eyes
* Nose
* Tongue
* Ear

PART - III

V. Answer in detail :

1. Five cell organelles and their function :

Organelle	Cell type	Function
Mitochondria	Eukaryotic	Makes energy.
Lysosome	Eukaryotic, animal cells only.	Removes unwanted material and waste.
Peroxisome	Eukaryotic	Regulate biochemical pathways that involve oxidation.
Vacuoles	Eukaryotic	Store water and nutrients.
Ribosomes	Eukaryotic	Make protein.

2. Functions of the human skeleton:

⇒ Body support
⇒ Facilitation of movement
⇒ Protection of internal organs.
⇒ Storage of minerals and fat.
⇒ Blood cell formation.
⇒ It gives the body its shape.
⇒ Makes blood cells and its also called musculoskeletal system.

Mark List :

S.NO	Name of the Students	Marks
1	R. Hemala	98
2	V. Pavishna	68
3	S. Sajeetha	94
4	M. Krishnaharan	79
5	P. Maithish	86
6	C. Vimal	59

Calculation

Unstructured Data :

98	68	94	79	86	59

Structured Data :

98	94	86	79	68	59

Highest value = 98

lowest value = 59

Frequency table :

Class Interval	Tally marks	Frequency
51 - 60	I	1
61 - 70	I	1
71 - 80	I	1
81 - 90	I	1
91 - 100	II	2
	Total =	6

Measures of central tendency:

* There are three measures of central tendency,

⇒ Arithmetic mean
⇒ Median
⇒ Mode

i) Arithmetic mean:

Arithmetic mean is written as,

$$\bar{x} = A + \left\{\frac{\Sigma fd}{N}\right\} \times CI$$

A = Assumed mean $\qquad d = \frac{x - A}{CI}$

N = Total number of frequency (Σf)

class Interval	Real limits	Frequency (f)	Mid point (x)	$d = \frac{x-A}{CI}$	fd
51 - 60	50.5 - 60.5	1	55.5	-2	-2
61 - 70	60.5 - 70.5	1	65.5	-1	-1
71 - 80	70.5 - 80.5	1	75.5	0	0
81 - 90	80.5 - 90.5	1	85.5	1	1
91 - 100	90.5 - 100.5	2	95.5	2	4
	$\Sigma f = N =$	6			$\Sigma fd = 2$

$$\text{Mean } \bar{x} = A + \left\{\frac{\Sigma fd}{N}\right\} \times CI$$

$A = 75.5$, $\Sigma fd = 2$, $N = 6$, $CI = 10$

$$\bar{x} = 75.5 + \left\{\frac{2}{6}\right\} \times 10$$

$$= 75.5 + 3.3$$

$$\bar{x} = 78.8$$

ii) Median :

Median can be written as,

$$\text{Median } (M) = l + \frac{\left[\frac{N}{2} - F\right]}{f} \times CI$$

l = Assumed mean, N = Total number of frequency, F = Cumulative frequency.

f = frequency, CI = Class Interval.

$$\text{Mean } \bar{x} = A + \left\{ \frac{\Sigma fd}{N} \right\} \times CI$$

$A = 75.5$, $\Sigma fd = 2$, $N = 6$, $CI = 10$

$$\bar{x} = 75.5 + \left\{ \frac{2}{6} \right\} \times 10$$

$$= 75.5 + 3.3$$

$$\bar{x} = 78.8$$

ii) Median :

Median can be written as,

$$\text{Median } (M) = l + \frac{\left[\frac{N}{2} - F \right]}{f} \times CI$$

l = Assumed Mean

N = Total number of frequency

F = cumulative frequency

f = frequency

CI = Class interval

Class Interval	Real limits	Frequency (f)	Cumulative frequency (cf)
51-60	50.5 - 60.5	1	1
61-70	60.5 - 70.5	1	2
71-80	70.5 - 80.5	1	3
81-90	80.5 - 90.5	1	4
91-100	90.5 - 100.5	2	6
		$\Sigma f = N = 6$	

$l = 70.5$, $\frac{N}{2} = \frac{6}{2} = 3$, $CI = 10$ $F = 2$, $f = 1$

$$M = 70.5 + \frac{[3-2]}{1} \times 10$$

$$= 70.5 + \frac{1}{1} \times 10$$

$$= 70.5 + 10$$

Median $= 80.5$

iii) Mode $= 3$ Median $- 2$ Mean

Mean $= 78.8$, Median $= 80.5$

Mode $= 3\,(80.5) - 2\,(78.8)$

$= 241.5 - 157.6$

Mode $= 83.9$

Method of studying Variation :

i) Range

ii) Quartile deviation

iii) Mean deviation (or) Average deviation (M.D)

iv) Standard deviation

i) Range :

Range = Highest value - Lowest value

Highest value = 98 , Lowest value = 59

$= 98 - 59$

$\therefore R = 39$

ii) Quartile Deviation :

$$Q_D = \frac{Q_3 - Q_1}{2}$$

$$Q_1 = l_1 + \left[\frac{\left(\frac{N}{4} - F_1\right)}{f_1}\right] \times CI$$

$$Q_3 = l_3 + \left[\frac{\left(\frac{3N}{4} - F_3\right)}{f_3}\right] \times CI$$

Class Interval	Real Limits	Frequency (f)	Cumulative Frequency (cf)
51-60	50.5-60.5	1	1
61-70	60.5-70.5	1	2
71-80	70.5-80.5	1	3
81-90	80.5-90.5	1	4
91-100	90.5-100.5	2	6
		$\leq f = N = 6$	

i) $Q_1 = l_1 + \left[\frac{\frac{N}{4} - F}{f}\right] \times CI$

$l_1 = 60.5$, $\frac{N}{4} = \frac{6}{4} = 1.5$, $F_1 = 1$, $f = 1$

$Q_1 = 60.5 + \left[\frac{1.5 - 1}{1}\right] \times 10$

$= 60.5 + 0.5 \times 10$

$= 60.5 + 5$

$Q_1 = 65.5$

ii) $Q_3 = l_3 + \left[\frac{\frac{3N}{4} - F_3}{f_3}\right] \times CI$

$l_3 = 90.5$, $\frac{3N}{4} = \frac{3(6)}{4} = \frac{18}{4} = 4.5$, $CI = 10$,

$F_3 = 4$, $f_3 = 2$

$= 90.5 + \left[\frac{4.5 - 4}{2}\right] \times 10$

$= 90.5 + \frac{0.5}{2} \times 10$

$= 90.5 + 2.5$

$Q_3 = 93$

iii) $Q_D = \frac{Q_3 - Q_1}{2}$

$= \frac{93 - 65.5}{2}$

$= \frac{27.5}{2}$

$Q_D = 13.75$

iii) Mean deviation / Average Deviation

$$\bar{x} = \frac{\Sigma fx}{\Sigma f}$$

$$A.D = \frac{\Sigma fd}{\Sigma f}$$

$$d = |x - \bar{x}|$$

class Interval	Frequency (f)	Mid point (x)	$d = \lvert x - \bar{x} \rvert = \lvert x - 78.8 \rvert$	fd
51 - 60	1	55.5	23.3	23.3
61 - 70	1	65.5	13.3	13.3
71 - 80	1	75.5	3.3	3.3
81 - 90	1	85.5	6.7	6.7
91 - 100	2	95.5	16.7	33.4
	$\Sigma f = 6$			$\Sigma fd = 80$

$$AD = \frac{80}{6}$$

$$AD = 13.33$$

iv) Standard Deviation :

$$\sigma = \sqrt{\frac{\Sigma f d^2}{\Sigma f} - \left(\frac{\Sigma f d}{\Sigma f}\right)^2} \times CI$$

Where $d = \frac{x - A}{CI}$

Class Interval	Frequency (f)	Mid Point (x)	$d = \frac{x-A}{CI}$	d^2	fd	fd^2
51-60	1	55.5	-2	4	-2	4
61-70	1	65.5	-1	1	-1	1
71-80	1	75.5	0	0	0	0
81-90	1	85.5	1	1	1	1
91-100	2	95.5	2	4	4	8
	$\Sigma f = N = 6$				$\Sigma fd = 2$	$\Sigma fd^2 = 14$

$$\sigma = \sqrt{\frac{\Sigma fd^2}{\Sigma f} - \left(\frac{\Sigma fd}{\Sigma f}\right)^2} \times CI$$

$$= \sqrt{\frac{14}{6} - \left(\frac{2}{6}\right)^2} \times 10$$

$$= \sqrt{\frac{14}{6} - (0.33)^2} \times 10$$

$$= \sqrt{2.33 - 0.108} \times 10$$

$$= \sqrt{2.222} \times 10$$

$$= 1.490 \times 10$$

$$\sigma = 14.9$$

Spearmans Rank difference Correlation coefficients :

$$\rho = 1 - \frac{6 \Sigma D^2}{N(N^2-1)}$$

D = Difference in Ranks

N = Number of Data

S.No	Name of the students	Science	Rank (R_1)	Maths	Rank (R_2)	$d = R_1 - R_2$	d^2
1	R. Hemala	98	1	80	3	-2	4
2	V. Parishna	68	5	78	4.5	0.5	0.25
3	S. Sajeetha	94	2	95	1	1	1
4	M. Krishnaharan	79	4	60	6	-2	4
5	P. Maithish	86	3	78	4.5	-1.5	2.25
6	C. Nimal	59	6	86	2	4	16
							$\Sigma d^2 = 27.5$

$$\rho = 1 - \frac{6 \Sigma d^2}{N(N^2-1)}$$

$N = 6, \ \Sigma d^2 = 27.5$

$$= 1 - \frac{6(27.5)}{6(36-1)}$$

$$= 1 - \frac{165}{6(35)}$$

$$= 1 - \frac{165}{210}$$

$$= 1 - 0.7857$$

$$\rho = 0.2143$$

GRAPH

1) Histogram :

class Interval	Real limit	Frequency
51 - 60	50.5 - 60.5	1
61 - 70	60.5 - 70.5	1
71 - 80	70.5 - 80.5	1
81 - 90	80.5 - 90.5	1
91 - 100	90.5 - 100.5	2

2) Frequency polygon:

class Interval	Mid point	Frequency
51 - 60	55.5	1
61 - 70	65.5	1
71 - 80	75.5	1
81 - 90	85.5	1
91 - 100	95.5	2

Cumulative Frequency curve :

class Interval	Real limits	Mid point	f	cf	
51 - 60	50.5 - 60.5	55.5	1	1	6
61 - 70	60.5 - 70.5	65.5	1	2	5
71 - 80	70.5 - 80.5	75.5	1	3	4
81 - 90	80.5 - 90.5	85.5	1	4	3
91 - 100	90.5 - 100.5	95.5	2	6	2

2) Cumulative percentage frequency curve :

class Interval	Frequency	Mid point	cf	$\frac{cf}{N} \times 100\%$
51 - 60	1	55.5	1	0.001
61 - 70	1	65.5	2	33.33
71 - 80	1	75.5	3	50.
81 - 90	1	85.5	4	66.6
91 - 100	2	95.5	6	100

Conclusion :

i) Measures of central tendency :

i) Arithmetic mean = 78.8

ii) Median = 80.5

iii) Mode = 83.9

ii) Method of studying variation :

i) Range = 39

ii) Quartile Deviation = 13.75

iii) Mean deviation (x) = 13.33

Average deviation

iv) Standard deviation = 14.9

iii) Rank correlation :

$\rho = 0.2143$