

Indian Statistical Institute

Junior Research Fellowship in Psychology (2015)

[The candidates for Junior Research Fellowship in Psychology are required to take short answer type tests in the forenoon as well as in the afternoon. Calculator is not allowed.]

Test Code: SCA

(Forenoon)

Full marks = 100

Time = 2 hours

[Attempt any **five** questions]

20 x 5 = 100

1. What do you mean by good research in Psychology? Five research problems are given below. Choose any two, define variables and outline your research plan either by experimental or by non-experimental methods.
 - (a) How does social network affect subjective well-being?
 - (b) How does task anxiety affect job performance?
 - (c) How does child-rearing practice affect self-concept?
 - (d) How does leadership affect group morale?
 - (e) How does perceptual motor-skill affect depth perception?
2. Discuss relative merits and demerits of Summated rating scale and Equal appearing interval scales.
3. Qualitative data collection is prelude to exploring psychological concept – Justify. Below is the poem. Explore bipolar adjectives from it and construct one semantic differential scale.

“I do not pray to protect me from perils, let me be fearless.
Amidst sorrow and pain, I may not be consoled, let me overcome.
I need not be helped, just let my strength hold.
Even if belittled or deceived by the world, let me not feel small.
I do not pray to be rescued, let me have the strength to pull through.
You may not lighten my burden, nor console, let me carry on.
In happiness let me recognize your face humbly –
In the night of misery when the world deceives,
Let me not doubt you.”

4. Explain the difference between standard score and standardized scores. Below are the raw scores of 7 individuals A, B, C, D, E, F, G. Estimate T-scores and arrange the persons in ascending orders.

| | | | | | | |
|----|----|----|----|----|----|----|
| A | B | C | D | E | F | G |
| 10 | 20 | 25 | 35 | 50 | 11 | 15 |

5. A total of 180 psychiatric patients on drugs were classified according to their diagnosis. The frequency distribution of the diagnosis is given as follows.

| | | | | |
|-----------------------------|---------------|--------------------|----------|----------------------|
| Type of psychiatric disease | Schizophrenia | Affective Disorder | Neurosis | Personality Disorder |
| Number Diagnosed | 72 | 30 | 33 | 45 |

Perform an appropriate test of hypothesis to determine whether a psychiatric patient is equally likely to be diagnosed in any of the four categories. The approximate critical value at 5% level is 7.815.

6. Examine if the following statements are true or false. You must mention the reason/reasons behind your answer.
- Mean \bar{x} of a random sample is an unbiased estimate of the population mean;
 - An estimator is a variable whereas a parameter is constant;
 - Because the value correlation coefficient computed from a set of bivariate observations is found to be 0.92, the two variables are linearly related;
 - Critical region and acceptance region are disjoint;
7. The following table gives the frequency distribution of the number of children in 560 families.

| | | | | | | |
|------------------------|----|-----|---|---|----|---|
| Number of children (x) | 0 | 1 | 2 | 3 | 4 | 5 |
| Number of families (f) | 80 | 278 | * | * | 10 | 2 |

Some frequencies, i.e., number of families (x) corresponding to number of children are missing. The mean number of children is 1.35.

Find the missing frequencies and then compute the variance of number of children.

8. Three optional courses are taught in Psychology departments of different colleges under a University. The class sizes for different courses under different colleges are given below.

| College | Optional courses | | |
|---------|------------------|----|----|
| | 1 | 2 | 3 |
| A | 23 | 55 | 30 |
| B | 45 | 60 | 40 |
| C | 54 | 72 | 18 |
| E | 78 | 45 | 34 |
| F | 66 | 70 | 44 |

Test whether the mean class sizes are different for the 3 courses using a non-parametric test. Name the test you use. The approximate critical value at 5% level is 5.991.

9. (a) A researcher is interested in knowing whether there is a correlation between IQ of a person and the number of hours he spends in front of Television. Using Spearman's Rank Correlation coefficient and the data from the following table determine whether there is any correlation between the two variables. What is the appropriate statistic?

| | | | | | | | | | | |
|----------------------|-----|----|-----|-----|----|-----|----|-----|-----|-----|
| IQ | 106 | 86 | 100 | 101 | 99 | 103 | 97 | 113 | 112 | 110 |
| Hours of TV per week | 7 | 0 | 27 | 50 | 28 | 29 | 20 | 12 | 6 | 17 |

The approximate critical value at 5% level is 0.714.

- (b) The correlation coefficient between I.Q. (x_1), frequency of visiting theatres per month (x_2) and performance in the final examination (x_3) for a group of students have been found to be

$$r_{12} = 0.24 \quad r_{13} = 0.80 \quad \text{and} \quad r_{23} = 0.60$$

Give your comments on these values. Do you really think that frequency of visiting theatres per month has a positive effect on the performance in the final examination? Justify your answer.

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Test Code: SCB

(Afternoon)

Full marks = 100

Time = 2 hours

[Attempt any **two from Group-A** and any **three from Group-B**]

20 x 5 = 100

Group-A

1. What is filtering of attention? Does executive function of working memory govern attention?
2. State the differences between intelligence and reasoning. Write 10 items each for reasoning and intelligence test.
3. Discuss the role of neuropsychological assessment and intervention in geriatric care.
4. What is perceptual-motor skill? How does it affect cognitive development of child?

Group-B

5. Show similarity between stages of psycho-sexual development of Freud and Erikson's stages of psycho-social development.
6. What are the differences between self-confidence and self-efficacy. Critically discuss Bandura's theory of self-efficacy.
7. Job analysis is prelude to selection. How do you make job analysis for selection of research fellow in Psychology?
8. Discuss any theory of job satisfaction critically. Write 10 items measuring job satisfaction.
9. What is motivation? Discuss the theories of reading and writing motivation.
10. What do you mean by school climate? How does it affect teacher-pupil interactions?