

ARUNACHAL PRADESH PUBLIC SERVICE COMMISSION

SUBJECT: - STATISTICS

Time: 3 (Three) hours

Full marks: 100

Q.1. Attempt any ten questions.

10x3 = 30

- a) What is index number?
- b) Write down the classical definition of probability.
- c) State the theorem of total probability of two events.
- d) Explain the term 'least square'.
- e) Define the term 'linear programming'.
- f) What is time reversal test?
- g) What is queueing theory?
- h) What do you mean by life table?
- i) What are the uses of chi-square test?
- j) What do you mean by sample?
- k) Define regression analysis.
- l) List out methods of collection of official statistics.
- m) Explain the term 'percentile score'.
- n) Explain three limitations of NSS.

Q.2. Attempt any five questions.

5x8 = 40

- a) Find out the probability of drawing either a spade or an ace from a pack of 52 cards.
- b) What do mean by the 'sample space'? Explain with an example.
- c) A bag contains 3 green and 8 red balls. If one ball is drawn from it at random, find the chance that ball drawn is green.
- d) Distinguish between fertility rates and reproduction rates.
- e) A coin is tossed 400 times and it turns up heads 216 times. Discuss whether the coin may be unbiased one.
- f) What do mean by 'standard error'? How does it differ from standard deviation?
- g) What are the defects of Indian agricultural statistics?

Q.3. Attempt any two questions.**2x 15 = 30**

- a) How is the population Census conducted in India? Discuss the salient features of the Indian population census of 2011.
- b) The 200 digits are chosen at random from a set of tables. The frequencies of the digits are :

| | | | | | | | | | | |
|------------|----|----|----|----|----|----|----|----|----|----|
| Digits : | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Frequency: | 18 | 19 | 23 | 21 | 16 | 25 | 22 | 20 | 21 | 15 |

Use χ^2 test to assess the correctness of the hypothesis that the digits are distributed in equal numbers in the tables from which these were chosen. (Value of χ^2 for 9 d.f. at 5% level of significance is 16.919).

- c) From the following data of a city calculate - a) Crude birth rate; b) General fertility rate; c) Age specific fertility rate; and d) Total fertility rate :

| Age-group | No. of women (000) | No. of live birth |
|-----------|--------------------|-------------------|
| 15- 19 | 17 | 340 |
| 20 - 24 | 18 | 1,980 |
| 25 - 29 | 20 | 2,900 |
| 30 - 34 | 15 | 1,500 |
| 35 - 39 | 12 | 840 |
| 40 - 44 | 10 | 400 |
| 45 - 49 | 8 | 40 |

The total population of the city in 2012 was 10, 00,000.

- d) How do you define reliability in statistics? What are different methods used to improve the reliability to optimize the result in sampling.

#####