Total No. of Questions : 6]

SEAT No. :

P2208

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M.Com. (Semester - II)

202 : BUSINESS STATISTICS

(2019 Pattern) (CBCS)

Time : 3 Hours] *[Max. Marks : 60*

Instructions to the candidates :

1) ***Question No. 1 and Question No. 6 are compulsory.***
2) ***Solve any three questions from Question No. 2 to Question No. 5.***
3) ***Figures to the right indicate full marks.***
4) ***Use of calculator and statistical table is allowed.***

Q1) Choose the correct alternative from each of the following (any 6): [1each] **[6]**

i) Secular trend in time series is of nature _____.

a) increasing

b) decreasing

c) stagnant

d) all the above (a, b & c)

ii) In time series analysis the method of moving averages is used to estimate_____.

a) seasonal variations b) cyclical variation

c) frend d) irregular variation

iii) Which of the following is not a discrete random variable (r.v)?

a) No. of childrens in the family

b) No. of daughters born to a couple until they get a son

c) Weight of a newly born baby

d) No. of persons possessing O -Ve blood group

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iv) If X is a r.v with mean 5 and variance 16. What are the values of mean and standard deviation of $Y = \left(\frac{X-5}{4}\right)$?

a) 0, 5 b) 0, 1

c) 1, 5 d) 5, 0

v) If $X \rightarrow B(n, p)$ with $E(x) = \frac{5}{3}$, var $(x) = \frac{10}{9}$ then the value of 9 is _____.

a) $\frac{1}{3}$ b) $\frac{2}{3}$

c) $\frac{1}{6}$ d) $\frac{5}{6}$

vi) If $X \rightarrow$ poisson (3) then its variance (X) _____.

a) 6 b) 9

c) $\sqrt{3}$ d) 3

vii) A null hypothesis is a _____.

a) hypothesis which is simple

b) hypothesis of interest

c) hypothesis of no difference

d) hypothesis which assign value 0 to the parameter.

viii) Type I error is _____.

a) accept Ho When it is true

b) reject Ho When it is true

c) accept Ho When it is false

d) reject Ho When it is false

Q2) a) Define 'time series'. Discuss the four components of time series. **[5]**

b) Compute 4-yearly centred moving average, for the following data : **[5]**

Year	2012	2013	2014	2015	2016	2017	2018	2019
Sales (in lakhs)	3.6	4.3	4.3	3.4	4.4	5.4	3.4	2.4

c) Discuss the merits and demerits of exponential smoothing. **[4]**

Q3) a) Explain the terms : **[5]**

random variable, discrete r.v., Continuous r.v.

b) If three balanced coins are tossed simultaneously, If a r.v.x denotes the number of fails, then find the probability distribution of r.v.x Hence obtain E(x). **[5]**

c) The joint probability distribution of (x, y) is **[4]**

(x,y).	(0, –1)	(0, 1)	(1,–1)	(1, 1)
$p(x, y)$	2/25	3/25	8/25	12/25

i) Obtain marginal probability distributions of x and y.

ii) Obtain conditional probability distribution of y given ($x = 0$)

Q4) a) Define Binomial distribution, state its probability mass function (p.m.f.), mean and variance. State two real life situation, where the distribution is applicable. **[5]**

b) Define Poisson distribution, State its p.m.f., mean and variance. **[5]**

If $X \rightarrow$ poisson (m) with $P(x = 1) = 2\ P(x = 2)$ then find mean of x.

c) Define normal distribution. State it probability density function (p.d.f.), mean and variance. **[4]**

Q5) a) Explain the terms : **[5]**

hypothesis, nullhypothesis, alternative hypothesis, critical region, acceptance region.

b) Explain the terms in detail: **[5]**

Type I error and Type II error

c) Explain paired t- test. **[4]**

Q6) Attempt <u>any two</u> of the following : **[2 × 6=12]**

a) Describe the

i) moving average method and

ii) least square method for the estimation of trend

b) A fair coin is tossed 3 times. A person receives Rs. X^2, if he gets X number of heads. find his expected gain.

c) If $X \rightarrow N\ (100,16)$ then find $P(X \leq 100)$, $P(X \geq 100)$, $P(X \geq 104)$, $P(X \leq 96)$, mean and variance of X.

d) Explain the chi- square test of goodness of fit.

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