(3)

C2M522

Class - FYBCom-Sem-2
Exam - Reg/ATKT - May-Qr
Sub - Maths

Roll No:_____ Jr. Supervisor Sign. Date - 05/04/2022

Q.1 Multiple Choice Question **Marks: 50**

1) For the function $f(x) = x - x^2$, the value of $f(-1)$ is _____.
a) 5 b) 0
c) -2 d) 1

Ans._____

2) The derivative of $5x^2 + 10x + 7$ w. r. t. x is _____.
a) 5x + 10 b) 10x + 10
c) 10x - 10 d) 5x + 10x +1

Ans._____

3) A Sum of money amounts to Rs. 11700 in 3 years and Rs. 13500 in 5 years. Find simple interest on it for 1 year.
a) Rs.600 b) Rs.1800
c) Rs.1500 d) Rs.900

Ans._____

4) For the 10 pairs of distinct observations, if $\Sigma d^2 = 33$, the value of rank correlation coefficient is _____.
a) 0.8 b) 0.2
c) 0.4 d) 0.6

Ans._____

5) Usual notation of marginal profit is _____.
a) P/x b) dP/dx
c) dP/dc d) dP/dt

Ans._____

6) If the period of moving averages coincides with period of business cycle, the following variations are minimised.
a) random variations b) seasonal variations
c) irregular variations d) cyclical variations

Ans._____

7) The quantity index number _____ measures changes in level of expenditure.
a) never b) sometimes
c) rarely d) always

Ans._____

8) The_____ random variable is the no. of successes r in the n trials.
a) constant b) Continuous
c) Random d) Binomial

Ans._____

9) The graph of $y = f(x)$ is the frequency curve of the normal distribution and it is called a _____ curve.
a) linear b) Continuous
c) Normal d) constant

Ans._____

10) If f(x) = 74.9 , then th vaue of f(2.7) is _____.
a) 74.9
b) 79.4
c) 74.5
d) 75.4

Ans._____

11) The derivative of 4^x w. r. t. x is _____.
a) 4^x
b) $4^x \log 4$
c) $4^x \log x$
d) $\log x$

Ans._____

12) If the simple interest on Rs.30,000 for 4 years is Rs. 9,600 , the rate of interest p.a is _____.
a) 0.06
b) 0.07
c) 0.08
d) 0.1

Ans._____

13) If both the variables increase or decrease together then there is _____ correlation between them
a) negative
b) Positive
c) zero
d) no

Ans._____

14) The following variations occure due to seasonal changes in a time series_____.
a) random variations
b) irregular variations
c) seasonal variations
d) cyclical variations

Ans._____

15) If prices P_1, P_0 and quantity q_1 are known, the following index number can be calculated.
a) Laspeyer's index number
b) fisher's index number
c) paasche's index number
d) Dorbish Bowley index number

Ans._____

16) For a standard normal variate (z) , if the area between z = 0 and z = 1.3 is 0.4032 then probability $(0 < z < 1.3)$ is _____.
a) 0.0968
b) 0.9032
c) 0.4032
d) 0.8064

Ans._____

17) A random variable X follows Poisson distribution if it assumes only _____ values.
a) non-negative
b) Positive
c) non-positive
d) negative

Ans._____

18) Price is a_____ function of demand.
a) Increasing
b) Decreasing
c) Constant
d) Linear

Ans._____

19) For the function f(x) = log x, the base of logarithm is _____.
a) 10
b) e
c) a
d) 0

Ans._____

20) The derivative of 17 w. r. t. x is _____.
a) 1
b) 0
c) 17
d) 2

Ans._____

21) If the elasticity of demand is between 0 and 1 ,the demand is said to be _____.
a) Elastic
b) Inelastic
c) constant
d) Perfectly elastic

Ans._____

22) The function y = 9 is always _____.
a) Increasing
b) Decreasing
c) constant
d) Polynomial

Ans._____

23) The product of price and demand is known as _____.
a) Total revenue
b) marginal revenue
c) average revenue
d) revenue

Ans._____

24) The point where 'there is no profit no loss' is called_____.
a) Zero point
b) Break even point
c) Break odd point
d) saddle point

Ans._____

25) The simple interest on Rs. 15,000 for 8 months at 10% p.a. is _____.
a) Rs. 1,000
b) Rs. 1,500
c) Rs. 1,050
d) Rs. 1,005

Ans._____

26) The future value of an amount is always _____ its present value.
a) Greater than
b) Less than
c) Equal to
d) Not equal to

Ans._____

27) In EMI calculations, the rate of interest is compounded _____.
a) quarterly
b) yearly
c) monthly
d) half yearly

Ans._____

28) EMI stands for _____.
a) Equal Monthly Interest
b) Equated Monthly Installments
c) Equal Monetary Investment
d) Equal Monetary Installment

Ans._____

29) The compound interest in the 4th year at 8% p.a. on Rs. 30,000 is____.
a) 3023.3
b) 3000
c) 3030
d) 3131

Ans._____

30) The difference between simple interest and compound interest on an amount at r% p.a. after one year is ___.

a) One
b) 100
c) zero
d) 10

Ans._____

31) The total cost C = 1500+7x , when x = 3 the marginal cost is _____.

a) 1521
b) 21
c) 7
d) 3

Ans._____

32) A scatter diagram _____.

a) is a statistical test
b) must be curvilinear
c) must be linear
d) is a graph of x and y value

Ans._____

33) If f(x) = kx - 3 and f(1) = 0 , then k is _____.

a) 0
b) 1
c) 2
d) 3

Ans._____

34) The derivative of log x w.r.t. x is _____.

a) 1/x
b) 1
c) 0
d) not defined

Ans._____

35) If a sum of Rs. 25,000 becomes Rs. 31,000 at 8 % simple interest p.a., the number of years is ____.

a) 3 years
b) 4 years
c) 5 years
d) 6 years

Ans._____

36) If all points lie on straight line with negative slope then there is _____correlation.

a) zero
b) imperfect high degree positive
c) perfect negative
d) perfect positive

Ans._____

37) Floods, earthquakes and wars these are the examples of _____.

a) secular trend
b) irregular variations
c) seasonal variations
d) cyclical variations

Ans._____

38) The normal distribution curve never touches the _____.

a) positive y axis
b) y axis
c) x axis
d) negative y axis

Ans._____

39) If prices P_1,P_0 and q_1 are known, the following index number can be calculated.

a) paasche's index number
b) fisher's index number
c) Marshall Edgeworth
d) Laspeyer's index number

Ans._____

40) For Binomial Distribution, Mean = _____.

a) n + p
b) n × p
c) n - p
d) n/p

Ans._____

41) _____ is a group of well - defined objectes of same kind.

a) set
b) function
c) relation
d) variable

Ans._____

42) Let f be differential function and c be a stationary point then f has a local minimum at c if f''(c) is _____.

a) equal to c
b) greater than c
c) less than 0
d) greater than 0

Ans._____

43) An annuity and life insurance are _____.

a) same
b) different
c) dependent
d) independent

Ans._____

44) In the Spearman's rank correlation coefficient formula ' d ' is calculated as d = _____.

a) R1 - R2
b) R1 / R2
c) R1 + R2
d) R1 x R2

Ans._____

45) If the values of regression coefficients are 0.4 and 0.9 , then the value of correlation coefficient is _____.

a) 0.7
b) 0.6
c) -0.6
d) 0.36

Ans._____

46) The variations occur due to natural calamities is _____.

a) random variations
b) seasonal variations
c) cyclical variations
d) variations

Ans._____

47) _____ Index Number is computed by geometric mean of Laspeyre's and Paasche's index numbers.

a) Laspeyer's
b) Paasches
c) Fishers
d) Dorbish Bowley

Ans._____

48) Standard deviation of normal distribution is _____.

a) α
b) π
c) σ
d) ß

Ans._____

49) The graph of quadratic function is _____.

a) parabola
b) straight line
c) hyperbola
d) circle

Ans._____

50) _____ is the person whose age and life expectancy is going to be used to calculate the benefits of the annuity.

a) owner
b) annuitant
c) beneficiary
d) agent

Ans._____

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Exam - Reg / ATKT - May - 2
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Date 5/4/22

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Duration: 3 hour & 15 Minutes. **Marks: 100**

Q.1 Multiple Choice Question (Separate Sheet Attached) **50**

Q.2 Attempt any ONE of the following. **10**

A. A company manufactured notebooks. The weekly total cost function is given by $C = 15x + 3000$.
   a. If each notebook is sold at Rs.25, what is the minimum quantity that needs to be produced to ensure no loss?
   b. If the selling price of a notebook is increased by 20%, what would be the minimum quantity that needs to be produced and sold to ensure no loss?
   c. If it is known in advance that at least 400 notebooks can be sold per week, find the selling price to ensure the company, no loss.

B. Divide 50 into two parts such that their product is a maximum.

C. The cost of manufacturing x items of a product is given by $c = 2x^2 + 3x + 10$. Find the total cost, average cost, marginal cost and the marginal average cost, if 10 items are manufactured.

Q.3 Attempt any ONE of the following. **10**

A. A principal amounts to Rs.9,680, after 3 years and to Rs.10,880, after 5 years. Find the principal and the rate of simple interest.

B. Kartik purchased a T.V. set and paid Rs. 5000 immediately, another Rs. 5000 after a year and Rs. 5000, after 2 years and thus became debt free. Find the price of T.V. set if compound interest charged was 3.5% p.a.

C. Anurag took a loan of Rs.60,000 with 10% interest per month, to be repayment in 5 months. Calculate the EMI using reducing balance. Also calculate the interest and the principal repayment components for each EMI.

Q.4 Attempt any ONE of the following. **10**

A. The following data represents the product time in weeks(X) and the output in thousand units(Y) of a factory. Find the coefficient of correlation and interpret it.

X	7	5	4	11	10	12	14	9
Y	14	8	8	19	16	19	20	16

B. Calculate the rank correlation coefficient for the following data giving working capital in lakhs of Rs.(x) and profit in thousands of Rs. (y) of ten companies for the year 1990-1991.

x	15	32	25	30	35	20	19	22	27	31
y	50	70	65	72	90	58	53	57	68	74

C. Regression equations of two series are $2x - y - 15 = 0$ and $3x - 4y + 25 = 0$. Find the mean values of x and y and also the coefficient of correlation r.

Q.5 Attempt any ONE of the following **10**

A. Find 3 yearly moving averages and draw these on a graph paper. Also represent the original time series on the graph.

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007
Production (in thousand units)	12	15	20	18	25	32	30	40	44

B. Consider two index number series A and B as follows and splice them together so as to have one common series with base year (i) 1995, (ii) 2000.

Series A

Year	1995	1996	1997	1998	1999	2000
Index No.(base 1995)	100	107	115	120	130	150

Series B

Year	2000	2001	2002	2003
Index No.	100	109	124	145

C. A student attempts an on-line test of 20 multiple-choice independent questions. Each question has 4 possible answers of which only one is correct. Find the probability that (i) he has exactly 2 answers correct (ii) 3 or 4 answers correct (iii) none of the answers is correct (iv) at most 2 answers correct (v) 4 to 6 answers correct.

Q.6 Short notes any two out of the following. **10**

A. What is Annuity? Explain different types of annuity.
B. What is Time Series? Explain various components of time series with examples.
C. Selection of Base Period
D. Explain the term correlation and describe types of correlation.