FIRST SEMESTER B.Voc. DEGREE EXAMINATION, NOVEMBER 2018

(UG)

CC15U GN3 A11 (1)/CC18U GEC1 BM03 - BASIC NUMERICAL SKILLS

(General Course)

Time: Three Hours   Maximum: 80 Marks

Part A

Answer *all* questions. Each question carries 1 mark.

Fill in the blanks:

1. A set which contains no element is called ………….

2. If *A* and *B* are disjoint events then $A \cap B$ = ………….

3. …………. equation has one or more variables where each term's degree is not more than 1.

4. The roots of $3x^2 - 48 = 0$ are ………….

5. In an arithmetic progression with first term 'n' and common ratio 'd' the nth term is ………….

6. If an amount Rs. 2000/- became Rs. 2240 through a simple interest deposit after two years, then the interest rate is ………….

7. The value of variance present in the data 17, 17, 17, 17, 17 is ………….

8. The process of arranging data in groups according to similarities in character is called ………….

9. The geometric mean of 2, 4 and 8 is ………….

10. …………. variations are those caused by unusual, unexpected and accidental events.

(10 × 1 = 10 Marks)

Part B

Answer any *eight* questions. Each question carries 2 marks.

11. Two third of a number increased by 5 equals 27. Find the number.

12. Solve $x^2 - 6x + 9 = 0$

13. Which term of the series 93, 90, 87, … is 51?

14. What is a power set. What is the relation between the cardinalities of a finite set its power set.

15. Find the value of the determinant of $\begin{vmatrix} 1 & 2 & -3 \\ 2 & -1 & 3 \\ 3 & 2 & 4 \end{vmatrix}$

16. Using Venn diagram prove that $(A \cup B)' = A' \cap B'$

17. Define consumer Price Index Number

18. "Index numbers are economic barometers". Why

19. Represent the following frequency table by histogram

Marks	:	10-15	15-29	20-25	25-30	30-35
No. of students	:	5	20	47	38	10

20. If the arithmetic mean of two number is 25 and their geometric is 15, then what is their harmonic mean

(8 x 2 = 16 Marks)

Part C

Answer any *six* questions. Each question carries 4 marks.

21. A = { 1, 2, 3} B = {2, 3, 4} C = {3, 4, 5} Verify that

    i) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

    ii) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

22. Solve $7x - 4y - 20z = 0$

    $10x - 13y - 14z = 0$

    $3x + 4y - 9z = 11$

23. $P = \begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix}$ $Q = \begin{bmatrix} -1 & 2 \\ 4 & 3 \end{bmatrix}$ $R = \begin{bmatrix} 2 & -1 \\ 6 & 5 \end{bmatrix}$

    Find $P(Q + R)$ and $PQ + PR$ and Prove $P(Q + R) = PQ + PR$

24. Find two natural numbers whose sum is 20 and whose product is 64.

25. The sum of 3 numbers in AP is 15. If 1, 3,9 are added to them respectively, the resulting numbers are in G.P. Find the numbers.

26. Find the quartile measure of dispersion and its coefficient for the data given below

Age	:	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No .of persons	:	15	30	53	75	100	110	115	125

27. What are the main types of bar diagrams.

28. Explain the steps used in the construction of Consumer Price Index Numbers.

(6 x 4 = 24 Marks)

Part D

Answer any *two* questions. Each question carries 15 marks.

29. a) Find the inverse of A where $A = \begin{bmatrix} 3 & 5 & 7 \\ 2 & -3 & 1 \\ 1 & 1 & 2 \end{bmatrix}$ **(8 Marks)**

    b) If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ show that $A^2 - 4A - 5I = 0$ **(7 Marks)**

30. Below are given the figures of production (in thousand tons) of a sugar factory

Year	:	2004	2005	2006	2007	2008	2009	2010
Production	:	77	88	94	85	91	98	90

    i)   Fit straight line by the method of least squares and find the trend values

    ii) What is the monthly increase in production

    iii) Eliminate the trend

31. Solve using crammer's rule

    $3x + 2y + z = 6$

    $2x - 3y + 3z = 2$

    $x + y + z = 3$

(2 x 15 = 30 Marks)

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