K20U 1338

Reg. No. : .....

Name : .....

III Semester B.Com. Degree (CBCSS – Sup./Imp.) Examination, November 2020

(2014 – '18 Admns.)

General Course

3A12 COM : NUMERICAL SKILLS FOR BUSINESS

Time : 3 Hours

Max. Marks : 40

PART – A

Answer **all** questions. **Each** carries ½ mark :

1. In a _____ matrix, all the elements above the leading diagonal are zero.
   a) Upper triangular
   b) Lower triangular
   c) Diagonal
   d) Scalar

2. If $125^{-2/3}$ = _____
   a) 1/5
   b) 1/25
   c) 1/50
   d) 1/125

3. If $\sqrt{3^{x+2}} = 27$, then x = _____
   a) 2
   b) 3
   c) 4
   d) 6

4. If $A = \begin{bmatrix} 4 & 2 & 3 \\ 5 & -8 & 7 \\ 9 & 6 & 1 \end{bmatrix}$, the trace of A is _____
   a) 29
   b) – 3
   c) 4
   d) – 8

(4×½=2)

P.T.O.

PART – B

Answer **any four** questions. **Each** carries **1** mark :

5. What is idempotent matrix ?

6. If 4 : 9 = 12 : X, find X.

7. Mr. P can complete a work in 12 days while Mr. P and Mr. Q together can complete it in 4 days. How many days will be required for Mr. Q to complete the same work by himself ?

8. Rationalise the denominator of $\frac{4\sqrt{2}}{\sqrt{11}-\sqrt{7}}$.

9. Two-third of a number decreased by 7 equals –1. Find the number.

10. If P : Q = 3 : 4, Q : R = 5 : 6 and R : S = 8 : 9, find P : Q : R : S. **(4×1=4)**

PART – C

Answer **any six** questions (**not** exceeding **one** page). **Each** carries **3** marks :

11. If $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 0 & 1 \\ 1 & -1 & 2 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 0 & 5 \\ 2 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$ $C = \begin{bmatrix} 1 & 0 & 1 \\ 2 & -1 & 1 \\ 1 & -1 & 0 \end{bmatrix}$, find 2A + 3B – 4C.

12. Verify De Morgan's Law for A = {2, 3}, B = {3, 4}, U = {1, 2, 3, 4, 5}.

13. Solve $3^{x+3} = 9^{2x+1}$.

14. A man buys 7 rabbits and 8 dogs for Rs. 8,695 and 4 rabbits and 9 dogs for Rs. 7,360. What is the cost of each ?

15. Mr. X borrowed Rs. 20,000 from a bank, but he could not repay any amount in a period of 4 years. So the bank demanded Rs. 26,500 from him. What is the rate of interest charged by bank ?

16. Explain the following with examples :
    a) Power set b) Singleton set c) Disjoint sets

17. If $\sqrt{x} = \sqrt{2} + \sqrt{3}$, show that $x^2 - 10x + 1 = 0$.

18. Construct the truth table to prove $\sim (p \vee q) \equiv \sim p \wedge \sim q$. **(6×3=18)**

PART – D

Answer **any two** questions. **Each** carries **8** marks :

19. Solve the following linear equations using matrix method :

$2x + 4y + z = 7$

$10x - 2y + 9z = 17$

$x + y + z = 3.$

20. a) Simplify $\frac{2\sqrt{3} + 3\sqrt{2}}{\left(\sqrt{6} + \sqrt{3}\right)\left(\sqrt{3} + \sqrt{2}\right)}$.

b) If $x = \sqrt{2} + 1$, show that $x^2 + 1/x^2 = 6$.

21. a) A machine costs Rs. 50,000. Calculate its scrap value at the end of 8 years. Depreciation was charged @ 10% p.a. on the diminishing balance method.

b) How long would a sum of money take to double itself if allowed to accumulate at 4½% compound interest payable yearly ? **(2×8=16)**