

B. Sc. DEGREE (C.B.C.S.S.) EXAMINATION, JANUARY 2019**(2016 Admission Supplementary)****SEMESTER V- OPEN COURSE (MATHEMATICS)****MT5D01AB – APPLICABLE MATHEMATICS****Time : Three Hours****Maximam Marks: 80****PART A****I. Answer all questions. Each question carries 1 marks.**

1. Solve the quadratic equation $x^2 - 10x + 25 = 0$.
2. In which quadrant all trigonometric ratios are positive.
3. Find the derivative of $\log a$.
4. Obtain 150% of 150.
5. Find the rate of interest per year if the interest charged for 8 months be 0.06 times of the money borrowed.
6. Find the time when Principal = Rs.1000, Rate = 8% per annum and SI = Rs.200.

(6X1=6)**PART B****II. Answer any seven questions. Each question carries 2 marks.**

7. Together Chottu and Nitu plough a field in 4 days. Nitu alone takes 6 days to plough the same field. In how many days can Chottu alone plough the field?
8. The length of a rectangle exceeds its width by 8 cm and the area of the rectangle is 240 sq. cm. Find the dimensions of the rectangle.
9. Evaluate 55% of $160 + 24\%$ of $50 - 36\%$ of 150 .
10. Evaluate $\left[(24^2 + 7^2)^{1/2} \right]^3$.
11. What is the Probability that the sum of digits obtained when two unbiased dice are tossed together is less than 10.
12. Integrate $y = \sec x (\sec x + \tan x)$.
13. Integrate $y = 2x - 3 \cos x + e^x$.
14. Divide 108 in two parts in the ratio 4 : 5.
15. Out of seven consonants and four vowels, how many words of three consonants and two vowels can be formed?
16. Solve graphically the equations $x + y = 50$ and $3x + y = 90$.

(7X2=14)**PART C****III. Answer any five questions. Each question carries 6 marks.**

17. In how many different ways can the letters of the word MACHINE be arranged so that the vowels may occupy only the odd positions?
18. Find the values of
 - i. $\operatorname{cosec}(-1410^\circ)$.

- ii. $\tan \frac{19\pi}{3}$.
19. (i) Differentiate $y = \log(\cos e^x)$
(ii) Integrate $\frac{e^{2x} - e^{-2x}}{e^{2x} + e^{-2x}}$.
20. Four persons are chosen at random from a group of 3 men, 2 women and 4 children. Find the probability that exactly two of them are children.
21. A number is increased by 10% and then it is decreased by 10%. Find the net increase or decrease percent.
22. Given that $\sqrt{3} = 1.732$. Find the value of $\sqrt{75} + \frac{1}{2}\sqrt{48} - \sqrt{192}$.
23. The lengths of the sides of a triangle are in the ratio 4:5:3 and its perimeter is 96 cm. Find its area.
24. A man derives his income from the investment of Rs.4150 at a certain rate of interest and Rs.3500 at one percent higher. His whole income for four years is Rs.1211. Find the rate of interest.

(5X6=30)

PART D

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

25. (i) A student goes to school at the rate of $2\frac{1}{2}$ Km/hr. and reaches 6 minutes late. If he travels at the speed of 3 Km/hr., he is 10 minutes early. What is the distance to school?
(ii) A marble tile measures 25 cm by 20 cm. How many tiles will be required to cover a wall of size 4m by 3m?
(iii) Rupees 16,000 is invested at 10% per annum compounded semiannually amounts to Rs.18522. Find the time period of investment.
26. (i) A sum of money doubles itself at compound interest in 15 years .In how many years will it becomes 8 times.
(ii) Suneeta can embroider a saree in 15 days. Her sister-in-law Abha can do the job in 10 days. They start embroidering the saree together, but two days later Abha gives up the work and goes to her parents. In how many days will Suneeta finish the remaining work of embroidering the saree.
27. (i) The average age of husband and wife who were married 7 years ago was 25 years then, the average age of the family including the husband, wife and the child born during the interval is 22 years more. How old is the child now?
(ii) Divide Rs.391 into 3 parts proportional to the fraction $\frac{1}{2} : \frac{2}{3} : \frac{3}{4}$.
28. (i) From a group of seven men and 6 women, five persons are to be selected to form a committee so that at least three men are there on the committee. In how many ways can it be done?
(ii) How many three digit numbers are completely divisible by 6?
(iii) Without using log tables , find the values of :
- (a) $\frac{1}{2}\log 25 - 2\log 3 + \log 18$.
(b) $2\log_{10} 5 + \log_{10} 8 - \frac{1}{2}\log_{10} 4$.

(2X15=30)