

E 3351

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Reg. No.....

Name.....

UNDERGRADUATE (C.B.C.S.S.) EXAMINATION, OCTOBER 2016

Fifth Semester

Open Course—APPLICABLE MATHEMATICS

(Offered by the Board of Studies in Mathematics)

[2013 Admission onwards]

Time : Three Hours

Maximum : 80 Marks

Part A

Answer all questions from this part.

Each question carries 1 mark.

1. Give an example of an irrational number.
2. How many roots are there for a quadratic equation.
3. In a right angle triangle ABC, how will you define $\sin A$.
4. What is a random experiment ?
5. What is the derivative of $\sin 2x$?
6. Write the equation of a line passing through the origin.
7. What is the LCM of 24 and 16 ?
8. Find the logarithm of 32 to the base 4.
9. A table is sold at 40 % profit. Then its selling price is ——— % of the C.P.
10. Compute $1^8 \times 3^0 \times 5^3 \times 2^2$.

(10 × 1 = 10)

Part B

Answer any eight questions.

Each question carries 2 marks.

11. Find x if $\log_2 x = -2$.
12. A coin is tossed five times and outcomes are recorded. How many possible outcomes are there ?
13. State product rule for differentiation.
14. Find the derivative of $2 \cos x$ at $x = \pi/2$.

Turn over

15. Evaluate $\int_1^2 x^2 dx$.
16. Simplify $\frac{a^5 b^2}{a^2 b^{-3}}$.
17. Find the HCF of 805, 1127 and 1449.
18. Find the least number which must be added to 18265 to obtain a perfect square.
19. Divide 832 into two parts in the ratio 4 : 9.
20. 6 Men or 8 Women earn Rs. 960 in one day. What is one days earning of 4 Men and 5 Women ?
21. If the diagonal of a square is 20 m ? Find its area.
22. Evaluate $0.8 \times 0.7 - 0.5 \times 0.3 + 0.16 \div 0.04$.

(8 × 2 = 16)

Part C

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

23. If $5 \cos \theta = 3$ evaluate $\frac{\operatorname{cosec} \theta - \cot \theta}{\operatorname{cosec} \theta + \cot \theta}$.
24. Draw the graph of $3x + 2y = 6$.
25. If $\log(a+1) = \log(4a-3) - \log 3$. Find a .
26. Two dice are thrown simultaneously. Find the probability of getting an even number as the sum.
27. For some given numbers their mean is 36. Find the mean of resulting numbers obtained when :
- (a) Each number is decreased by 10.
 - (b) Each number is divided by 9.

28. Simplify $\frac{x^{m+n} \times x^{n+l} \times x^{l+m}}{(x^m \times x^n \times x^l)^2}$.

29. A can do $\frac{2}{3}$ of a certain work in 12 days and B can do $\frac{1}{6}$ of the same work in 4 days. Find in how many days will they together complete the work.
30. Find the derivative of $(x-1)(x-2)$.
31. Find $\int (3-2x)^3 dx$.

(6 × 4 = 24)

Part D

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

32. (a) If $y = \frac{1}{5x-3}$ find $\frac{dy}{dx}$ at $x=1$.

(b) Evaluate $\int x(1+x^3) dx$.

33. A person invests Rs. 5,000 for three years at a certain rate of interest compounded annually. At the end of two years this sum amounts to Rs. 6,272.

Calculate :

- (i) The rate of interest per annum.
- (ii) The amount at the end of the third year.
34. A and B can do a piece of work in 40 days, B and C in 30 days, and C and A in 24 days (i) How long will it take them to do the work together ; (ii) In what time can each finish it working alone.
35. The cost price of an article is 25 % below the marked price. If the article is available at 15 % discount and its cost price is Rs. 2,400, find (i) its marked price ; (ii) Its selling price ; and (iii) The profit percent.

(2 × 15 = 30)