E 8697 (Pages : 3) Reg. No.....

Name.....

UNDERGRADUATE (C.B.C.S.S.) EXAMINATION, OCTOBER 2014

Fifth Semester

Open Course—APPLICABLE MATHEMATICS

(Offered by the Board of Studies in Mathematics)

Time : Three Hours Maximum Weight : 25

Part A

Answer **all** *questions.*
Each bunch of 4 *questions carries weight* 1.

I. 1 Every integer is a natural number. Write True *or* False :

2 Solve $2x - \frac{1}{x} = 1$.

3 If the angle A is acute and cot A = $\frac{4}{3}$. Find the value of sin A.

4 What is $\frac{d(\tan x)}{dx}$?

II. 5 Find the value of $\int 3x^2\, dx$.

6 A coin is tossed once. Find the probability of not getting a tail.

7 Find the square root of $27\frac{9}{16}$.

8 Find the H.C.F. of 90 and 162.

III. 9 Find the third proportional to 2 and 32.

10 If 14 % of a number is 315. Find the number.

11 Find the selling price if C.P. = Rs. 950 and profit = 18 %.

12 A sum of Rs. 900 is lent for one year at the rate 15 % per annum. Find the interest.

Turn over

IV. 13 Evaluate $\left(x^2\, y^3\, z\right)^3$.

14 Cost of 24 identical articles is Rs. 108. Find the cost of 40 similar articles.

15 A boy runs a distance of 16 km. in $1\frac{1}{3}$ hrs. Find his speed in m/sec.

16 The area of a square is 169 cm^2. Find its perimeter.

$(4 \times 1 = 4)$

Part B

Answer any **five** *questions.*
Each question has weight 1.

17 If $\log_{10}{}^8 = 0.90$. Find the value of $\log \sqrt{32}$.

18 Draw the graph of $y = x + 1$.

19 Find the derivative of $x^2 e^x$.

20 Find $\int \frac{\sin x}{\cos x}\, dx$.

21 Find the smallest number which when divided by 48 and 60 respectively, leaves a remainder 7 in each case.

22 Find the mean of first 8 whole numbers.

23 In how many years will Rs. 950 produce Rs. 399 as simple interest at 7 % ?

24 Evaluate $(xy)^{m-n} \cdot (yz)^{n-l} \cdot (zx)^{l-m}$.

$(5 \times 1 = 5)$

Part C

Answer any **four** *questions.*
Each question has weight 2.

25 The square of a positive number added to one-fourth of it is equal to 17. Find the number.

26 In how many ways can a team of 3 boys and 3 girls be selected from 6 boys and 5 girls.

27 A single letter is selected at random from the word 'Probability'. Find the probability that it is a vowel.

28 By selling an article for Rs. 810, a man loses 10 %. At what price should he sell it in order to gain 8 %.

29 Calculate the amount and compound interest on Rs. 4,600 in 2 years when the rates of interest of successive years are 10 % and 12 % respectively.

30 Simplify $\frac{1}{a+b}+\frac{1}{a-b}+\frac{2b}{a^2-b^2}$.

$(4 \times 2 = 8)$

Part D

Answer any **two** *questions.*
Each question has weight 4.

31 A kite is attached to a string. Find the length of the string, when the height of the kite is 60 m and the string makes an angle of 30° with the ground.

32 (a) Differentiate $x^2 \log x$ with respect to x.

(b) Find $\int \frac{1}{x(\log x)^2}\,dx$.

33 2 men or 3 women can do a piece of work in 45 days. Find in how many days will 6 men and 1 woman be able to complete the same work.

$(2 \times 4 = 8)$