E 4540 (Pages : 3) Reg. No.....

Name.....

UNDER GRADUATE (C.B.C.S.S.) EXAMINATION, OCTOBER 2012

Fifth Semester

Open Course—APPLICABLE MATHEMATICS

(Offered by the Board of Studies in Mathematics)

Time : Three Hours Maximum Weight : 25

Section A

Answer **all** *questions.*
Each bunch of four questions carries a weight of 1.

I. 1 Simplify $\left(a^{-2}b\right)^{\frac{1}{2}} \times \left(ab^{-3}\right)^{\frac{1}{3}}$.

2 In which quadrant the point (– 2, – 3) lies ?

3 In which quadrant all trignometric ratios are positive ?

4 The number of 5 digit license plate numbers that can be formed from the ten digits 0, 1, ... 9 is.

II. 5 Find the derivative of e^{2x}.

6 Find the value of $\int_0^1 \frac{1}{1+x^2}\,dx$.

7 Find the square root of 4489.

8 Find $1+\frac{1}{1+\frac{1}{2}}$.

III. 9 Evaluate $\sqrt{9-\sqrt{25}}$.

10 A number is increased from 125 to 150. Find the percentage increase.

11 Find the average of the numbers 36, 24, 82, 38.

12 Find the distance covered by a bus in 50 minutes at the speed of 42 km./hr.

IV. 13 Find the rate of interest per year if the interest charged for 8 months be 0.06 times of the money borrowed.

14 Diagonal of a square is 20 m. Find its area.

15 Find the H.C.F. of x^2y and xy^2.

16 If $a^2 + b^2 = 73$ and $ab = 24$. Find $a + b$.

$(4 \times 1 = 4)$

Turn over

Part B

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

17 Simplify $27^{2/3} \div \left(\frac{81}{16}\right)^{-1/4}$.

18 Draw the graph of $3x + 4y = 1$.

19 Differentiable log sin x with respect to x.

20 A pair of dice is thrown. What is the probability of getting a sum of 2 ?

21 What is the least number which when decreased by 5 is divisible by 36, 48, 21 and 28 ?

22 Find the third proportional to 2 and 32.

23 Evaluate 55 % 160 + 24 % 50 – 36 % 150.

24 Simplify $(xy)^{m-n} \cdot (yz)^{n-l} \cdot (2x)^{l-m}$.

$(5 \times 1 = 5)$

Part C

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

25 In how many ways can a committee of 3 be chosen from 5 married couples if a husband and wife cannot both sit on the committee.

26 Differentiate $x^2 \log x$ with respect to x.

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

28 Ram bought 240 toffees. He gave 0.4 times of these to his sister and $\frac{5}{12}$ of the remaining to his younger brother. Find how many toffees are still with him.

29 An aeroplane flies 750 km. in 40 minutes. Find the time taken by if to cover a distance of 900 km.

30 An urn contains 5 red and 10 black balls. Eight of them are placed in another urn. What is the chance that urn contains 2 red and 6 black balls.

$(4 \times 2 = 8)$

Part D

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

31 A bag contains 8 white and 6 red balls. Find the probability of drawing two balls of the same colour.

32 (a) Differentiate $\sin^{-1}\left(\sqrt{x}\right)$.

(b) Find $\int \frac{\sec^2 x}{5+3\tan x}\,dx$.

33 (a) Evaluate $\frac{x^{5+n}\times\left(x^2\right)^{3n+1}}{x^{7n-2}}$.

(b) Find the value of $\sin 30^\circ \cos 45^\circ - \cos 30^\circ \sin 45^\circ$.

$(2 \times 4 = 8)$