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Reg. No.................................

Name...................................

UNDERGRADUATE (C.B.C.S.S.) EXAMINATION, OCTOBER 2015

Fifth Semester

Open Course—APPLICABLE MATHEMATICS

(Offered by the Board of Studies in Mathematics)

(2013 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

Answer **all** *questions from this part.*
Each question carries 1 mark.

1. Find the greatest number which when divides 590, 908 and 1014 leaves the same remainder each time.

2. Solve the equation $x(x-1) = 42$.

3. In which quadrant the point $(-2, 1)$ lies.

4. Write the sample space for experiment the tossing three fair coins.

5. Find the derivative of $\sin(x+1)$.

6. What is $\int \sec x \tan x \, dx$?

7. What is $6\,P_2$?

8. Find the square root of 484.

9. 36 m/s is how many km/hr.

10. Multiply $2x + \dfrac{1}{2}y$ and $2x - \dfrac{1}{2}y$.

$(10 \times 1 = 10)$

Part B

Answer any **eight** *questions.*
Each question carries 2 marks.

11. Find two consecutive even natural numbers such that sum of their squares is 52.

12. Solve graphically the equations $x = 0$, and $x + 3y = 6$.

13. Given $\cot x = \dfrac{3}{4}$ and x lies in third quadrant, find the values of $\tan x$ and $\cos x$.

Turn over

14. Two dice are thrown. Let A denote the event getting an even number on the first die and B : getting an odd number on the first die. Describe the events A' and not B.

15. Integrate the function $x\sqrt{x+2}$.

16. Find the derivative of $\dfrac{\cos x}{1+\sin x}$.

17. Two numbers are in the ratio 5 : 8. 18. If their H.C.F is 6, find the numbers.

18. Evaluate $6\dfrac{2}{5}-4\dfrac{4}{15}+3\dfrac{5}{9}-2\dfrac{3}{10}$.

19. Find the mean proportion between 12 and 192.

20. If 15 men can complete a piece of work in 30 days, in how many days will 18 men complete it.

21. Two numbers are respectively 10 % and 25 % more than a third number. What percent is the first of the second ?

22. Factories $1-4\left(a-2b\right)^{2}$.

<div align="right">(8 × 2 = 16)</div>

Part C

Answer any six questions.
Each question carries 4 marks.

23. (i) Find the values of $\sin 765°$.

    (ii) $\tan 19\pi/3$.

24. A die is thrown, find the probability of the following events :

    (i) A prime number will appear.

    (ii) A number greater than or equal to 3 will appear.

25. Find the derivative of :

    (i) $\sqrt{x^{2}+1}$.

    (ii) $\left(ax+b\right)^{n}\left(cx+d\right)^{m}$.

26. The L.C.M. of two numbers is 15 times that of their H.C.F. If the sum of the L.C.M. and H.C.F. is 288. Find :

    (i)   The H.C.F and L.C.M.

    (ii) The other number if one number is 54.

27. Geetha read of a book on one day and $\frac{4}{5}$ of the reminder on another day. Find :

    (i)   Portion of the book left unread after one day.

    (ii) Portion of the book left after two days.

28. If $2A = 3B = 4C$, find $A : B : C$.

29. A can do a piece of work in 10 days and B in 15 days. How long will they take together to finish it.

30. An aeroplane flies 750 km in 40 min. Find :

    (i)   Its speed in km/hr.

    (ii) Time taken by it to cover a distance of 900 km.

31. The lengths of the sides of a triangle are in the ratio $4 : 5 : 3$ and its perimeter is 96 cm. Find its area.

$$(6 \times 4 = 24)$$

Part D

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

32. (a) Evaluate $\int\limits_{-5}^{5} |x + 2|\, dx$.

    (b) Find the derivative of $\dfrac{a + b\sin x}{c + d\cos x}$.

33. (a) A letter is chosen at random from the word 'ASSASSINATION'. Find the probability that the letter is : (i) A vowel ; (b) A consonant.

    (b) 6 pipes are required to fill a tank in 1 hour 20 minutes. How long will it take, if 5 pipes of the same type are used to fill the same tank.

34. (a) Two numbers are in the ratio $5 : 4$. If 3 is subtracted from the first and 2 is subtracted from the second, they become in the ratio $6 : 5$. Find the numbers.

    (b) In an examination 30 percent candidates failed in English, 35 percent failed in Mathematics and 27 percent failed in both the subjects. Find :

        (i)   Percentage of total failed.

        (ii) Percentage of total passed.

        (iii) The total number of candidates if 248 passed in both.

Turn over

35. (a) A certain sum of money invested for 5 years at 8% p.a simple interest earns an interest of Rs. 12,000. Find :

   (i) The sum of money.

   (ii) The compound interest earned by this money in two years and at 10 % p.a. compound interest.

   (b) A person bought a certain number of similar articles for Rs. 90. If he had paid rupee one move for each article, he would have got one article less for the same price. Find the price of each article.

$(2 \times 15 = 30)$