

RAVI MATHS TUITION CENTER , PH - 8056206308

REVISION TEST 2 [CHAPTER 2 & 3]

Date : 28-Jun-19

12th Standard 2019 EM

Business Maths

Reg.No. :

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Time : 02:30:00 Hrs

Total Marks : 90

20 x 1 = 20

JOIN WHATSAPP GROUP - 8056206305 [FOR ANSWERS RS.500 PER YEAR] UNLIMITED**QUESTION PAPERS WITH ANSWER**

1) $\int e^{2x}[2x^2 + 2x]dx$

- (a)
- $e^{2x}x^2 + c$
- (b)
- $xe^{2x} + c$
- (c)
- $2x^2e^2 + c$
- (d)
- $\frac{x^2e^x}{2} + c$

2) $\int \frac{e^x}{e^x + 1} dx$

- (a)
- $\log \left| \frac{e^x}{e^x + 1} \right| + c$
- (b)
- $\log \left| \frac{e^x + 1}{e^x} \right| + c$
- (c)
- $\log |e^x| + c$
- (d)
- $\log |e^x + 1| + c$

3) $\int \frac{2x^3}{4+x^4} dx$ is

- (a)
- $\log |4+x^4| + c$
- (b)
- $\frac{1}{2} \log |4+x^4| + c$
- (c)
- $\frac{1}{4} \log |4+x^4| + c$
- (d)
- $\log \left| \frac{2x^3}{4+x^4} \right| + c$

4) $\int_0^1 (2x+1)dx$ is

- (a) 1 (b) 2 (c) 3 (d) 4

5) $\int_{-1}^1 x^4 dx$ is

- (a) 1 (b)
- $2 \int_{-1}^1 x^3 e^{x^4} dx$
- (c) 0 (d)
- e^{x^4}

6) $\Gamma(n)$ is

- (a)
- $(n-1)!$
- (b)
- $n!$
- (c)
- $n\Gamma(n)$
- (d)
- $(n-1)\Gamma(n)$

7) $\int |x|^3 dx = \underline{\hspace{2cm}} + c$

- (a)
- $\frac{-x^4}{4}$
- (b)
- $\frac{|x|^4}{4}$
- (c)
- $\frac{x^4}{4}$
- (d) none of these

8) $\int \frac{2}{(e^x + e^{-x})^2} dx = \underline{\hspace{2cm}} + c$

- (a)
- $\frac{-e^{-x}}{e^x + e^{-x}}$
- (b)
- $\frac{-e^{-x}}{e^x + e^{-x}}$
- (c)
- $\frac{1}{(e^x + 1)^2}$
- (d)
- $\frac{1}{e^x - e^{-x}}$

9) $\int 3^{x+2} dx = \underline{\hspace{2cm}} + c$

- (a)
- $\frac{3^x}{\log 3}$
- (b)
- $\frac{9(3^x)}{\log 3}$
- (c)
- $\frac{3 \cdot 3^x}{\log 3}$
- (d)
- $\frac{3^x}{9 \log 3}$

10) $\int_0^{\frac{\pi}{2}} x \sin x dx =$

- (a)
- $\frac{\pi}{4}$
- (b)
- $\frac{\pi}{2}$
- (c)
- π
- (d) 1

11) The value of the integral $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\cos x}}{\sqrt{\cos x} + \sqrt{\sin x}} dx =$

- (a) 0 (b)
- $\frac{\pi}{2}$
- (c)
- $\frac{\pi}{4}$
- (d) none of these

12) $\int \frac{x^5 - x^4}{x^3 - x^2} dx = \underline{\hspace{2cm}} + c$

- (a) 1 (b) $\frac{x}{2}$ (c) $\frac{x^3}{2}$ (d) $\frac{x^2}{2}$

13) $\int \frac{2}{1-\cos 2x} = \text{_____} + c$

- (a) $-\cot x$ (b) $\cot x$ (c) $\sec x$ (d) $\tan x$

14) $\int_0^1 \frac{1}{2x-3} dx = \text{_____}$

- (a) $\frac{1}{2} \log 3$ (b) $-\frac{1}{2} \log 3$ (c) $\frac{1}{2} \log 1$ (d) 0

15) The profit of a function $p(x)$ is maximum when

- (a) $MC - MR = 0$ (b) $MC = 0$ (c) $MR = 0$ (d) $MC + MR = 0$

16) For the demand function $p(x)$, the elasticity of demand with respect to price is unity then

- (a) revenue is constant (b) cost function is constant (c) profit is constant (d) none of these

17) When $x_0 = 5$ and $p_0 = 3$ the consumer's surplus for the demand function $p_d = 28 - x^2$ is

- (a) 250 units (b) $\frac{250}{3}$ units (c) $\frac{251}{2}$ units (d) $\frac{251}{3}$ units

18) When $x_0 = 2$ and $P_0 = 12$ the producer's surplus for the supply function $P_s = 2x^2 + 4$ is

- (a) $\frac{31}{5}$ units (b) $\frac{31}{2}$ units (c) $\frac{32}{3}$ units (d) $\frac{30}{7}$ units

19) The demand and supply function of a commodity are $P(x) = (x - 5)^2$ and $S(x) = x^2 + x + 3$ then the equilibrium quantity x_0 is

- (a) 5 (b) 2 (c) 3 (d) 19

20) Area bounded by $y = |x|$ between the limits 0 and 2 is

- (a) 1 sq. units (b) 3 sq. units (c) 2 sq. units (d) 4 sq. units

ANSWER 7

7 x 2 = 20

21) Integrate the following with respect to x . $\frac{8x+13}{\sqrt{4x+7}}$

22) Integrate the following with respect to x . $\frac{1}{\sqrt{x+1} + \sqrt{x}-1}$

23) Integrate the following with respect to x .

$$\frac{x^3}{x+2}$$

24) If $f'x = \frac{1}{x}$ and $f(1) = \frac{\pi}{4}$, then find $f(x)$

25) Integrate the following with respect to x .

$$\frac{e^{3x} + e^{5x}}{e^x + e^{-x}}$$

26) Integrate the following with respect to x .

$$\frac{\cos 2x + 2 \sin^2 x}{\cos^2 x}$$

27) Find the area bounded by the line $y = x$, the x -axis and the ordinates $x = 1$, $x = 2$

28) Elasticity of a function $\frac{E_y}{E_x}$ is given by $\frac{E_y}{E_x} = \frac{-7x}{(1-2x)(2+3x)}$. Find the function when $x = 2$, $y = \frac{3}{8}$

29) Given the marginal revenue function $\frac{4}{(2x+3)^2} - 1$, show that the average revenue function is $P = \frac{4}{6x+9} - 1$

30) If $MR = 14 - 6x + 9x^2$, find the demand function.

ANSWER 7

7 x 3 = 30

31) Evaluate $\int \frac{ax^2 + bx + c}{\sqrt{x}} dx$

32) Evaluate $\int \frac{x+2}{\sqrt{2x+3}} dx$

- 33) Evaluate $\int \frac{5+5e^{2x}}{e^x+e^{-x}} dx$
- 34) Evaluate $\int (\log x)^2 dx$
- 35) Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin x}{\sin x + \cos x} dx$
- 36) Evaluate the integral as the limit of a sum: $\int_1^2 x^2 dx$
- 37) Find the area bounded by $y = 4x + 3$ with x- axis between the lines $x = 1$ and $x = 4$
- 38) Find the area bounded by $y = x$ between the lines $x = -1$ and $x = 2$ with x -axis.
- 39) Using integration find the area of the region bounded between the line $x = 4$ and the parabola $y^2 = 16x$.
- 40) The demand and supply function of a commodity are $p_d = 18 - 2x - x_2$ and $p_s = 2x - 3$. Find the consumer's surplus and producer's surplus at equilibrium price.

7 x 5 = 35

- 41) Evaluate $\int_0^1 (e^x - 4a^x + 2 + \sqrt[3]{x}) dx$
- 42) Evaluate $\int_{-1}^1 (x^3 + 3x^2)^3 (x^2 + 2x) dx$
- 43) If $f(x) = \begin{cases} x^2, & -2 \leq x < 1 \\ x, & 1 \leq x < 2 \\ x - 4, & 2 \leq x \leq 4 \end{cases}$, then find the following

(i) $\int_{-2}^1 f(x) dx$

(ii) $\int_{-2}^1 f(x) dx$

(iii) $\int_2^3 f(x) dx$

(iv) $\int_1^{1.5} f(x) dx$

(v) $\int_1^3 f(x) dx$

- 44) For the marginal revenue function $MR = 35 + 7x - 3x^2$, find the revenue function and demand function.
- 45) The marginal cost and marginal revenue with respect to commodity of a firm are given by $C'(x) = 8 + 6x$ and $R'(x) = 24$. Find the total Profit given that the total cost at zero output is zero.
- 46) In year 2000 world gold production was 2547 metric tons and it was growing exponentially at the rate of 0.6% per year. If the growth continues at this rate, how many tons of gold will be produced from 2000 to 2013? [$e^{0.078} = 1.0811$]
- 47) Find the area of the region bounded by the parabola $y^2 = 4x$ and the line $2x - y = 4$.

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REVISION PAPER 1 [CHAPTER 1 & 2]

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FOR ANSWERS JOIN WHATSAPP GROUP - 8056206305 [RS.500 PER YEAR] UNLIMITED**QUESTION PAPERS WITH ANSWER**1) If $A = \begin{pmatrix} 1 & 2 & 3 \end{pmatrix}$, then the rank of AA^T is

- (a) 0 (b) 2 (c) 3 (d) 1

2) The rank of the unit matrix of order n is

- (a)
- $n-1$
- (b)
- n
- (c)
- $n+1$
- (d)
- n^2

3)

The rank of the diagonal matrix $\begin{pmatrix} 1 & & 0 \\ & 2 & \\ & & -3 & & 0 \\ & & & & 0 \end{pmatrix}$

- (a) 0 (b) 2 (c) 3 (d) 5

4) If $\rho(A) = \rho(A, B)$ = the number of unknowns, then the system is

- (a) Consistent and has infinitely many solutions (b) Consistent and has a unique solution (c) inconsistent (d) consistent

5) if $\rho(A) \neq \rho(A, B)$, then the system is

- (a) Consistent and has infinitely many solutions (b) Consistent and has a unique solution (c) inconsistent (d) consistent

6) The system of linear equations $x+y+z=2, 2x+y+z=3, 3x+2y+k=4$ has unique solution, if k is not equal to

- (a) 4 (b) 0 (c) -4 (d) 1

7) Cramer's rule is applicable only to get an unique solution when

- (a)
- $\Delta_z \neq 0$
- (b)
- $\Delta_x \neq 0$
- (c)
- $\Delta_y \neq 0$
- (d)
- $\Delta_y \neq 0$

8) $|A_{n \times n}| = 3$ $|adj A| = 243$ then the value n is

- (a) 4 (b) 5 (c) 6 (d) 7

9) Rank of a null matrix is

- (a) 0 (b) -1 (c)
- ∞
- (d) 1

10) If $\begin{vmatrix} 2x & 5 \\ 8 & x \end{vmatrix} = \begin{vmatrix} 6 & -2 \\ 7 & 3 \end{vmatrix}$ then $x =$

- (a) 3 (b)
- ± 3
- (c)
- ± 6
- (d) 6

11) If A is a singular matrix, then $Adj A$ is.

- (a) non-singular (b) singular (c) symmetric (d) not defined

12) $\int 2^x dx$ is

- (a)
- $2^x \log 2 + c$
- (b)
- $2^x + c$
- (c)
- $\frac{2^x}{\log 2} + c$
- (d)
- $\frac{\log 2}{2^x} + c$

13) $\int \frac{\sin 5x - \sin x}{\cos 3x} dx$

- (a)
- $-\cos 2x + c$
- (b)
- $-\cos 2x + c$
- (c)
- $-\frac{1}{4} \cos 2x + c$
- (d)
- $-4 \cos 2x + c$

14) $\int \frac{e^x}{\sqrt{1+e^x}} dx$ is

(a) $\frac{e^x}{\sqrt{1+e^x}} + c$ (b) $2\sqrt{1+e^x} + c$ (c) $\sqrt{1+e^x} + c$ (d) $e^x\sqrt{1+e^x} + c$

15) If $\int_0^1 f(x) dx = 1$, $\int_0^1 xf(x) dx = a$ and $\int_0^1 x^2 f(x) dx = a^2$, then $\int_0^1 (a-x)^2 f(x) dx$ is

(a) $4a^2$ (b) 0 (c) $2a^2$ (d) 1

16) The value of $\int_2^3 f(5-x) dx - \int_2^3 f(x) dx$ is

(a) 1 (b) 0 (c) -1 (d) 5

17) $\int_0^\infty x^4 e^{-x} dx$ is

(a) 12 (b) 4 (c) 4! (d) 64

18) $\int e^x (1 - \cot x + \cot^2 x) dx = \text{_____} + c$

(a) $e^x \cot x$ (b) $-e^x \cot x$ (c) $e^x \operatorname{cosec} x$ (d) $-e^x \operatorname{cosec} x$

19) $\int e^x f(x) + f'(x) dx = \text{_____} + c$

(a) $e^x f(x)$ (b) $e^x + f(x)$ (c) $2e^x f(x)$ (d) $e^x - f(x)$

20) $\int a^{3x+2} dx = \text{_____} + c$

(a) a^{3x+2} (b) $\frac{a^{3x+2}}{3}$ (c) $\frac{a^{3x+2}}{3 \log a}$ (d) $3 \log a (a^{3x+2})$

ANSWER ANY 7

7 x 2 = 20

21) Solve the following system of equations by rank method

$x+y+z=9, 2x+5y+7z=52, 2x-y-z=0$

22) Solve the following equations by using Cramer's rule

$2x + 3y = 7; 3x + 5y = 9$

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23) A commodity was produced by using 3 units of labour and 2 units of capital, the

total cost is Rs 62. If the commodity had been produced by using 4 units of labour and one unit of capital, the cost is Rs 56. What is the cost per unit of labour and capital? (Use determinant method).

24) A total of Rs 8,600 was invested in two accounts. One account earned $4\frac{3}{4}\%$ annual

interest and the other earned $6\frac{1}{2}\%$ annual interest. If the total interest for one year was Rs 431.25, how much was invested in each account? (Use determinant method).

25) Two types of soaps A and B are in the market. Their present market shares are 15% for A and 85% for B. Of those who bought A the previous year, 65% continue to buy it again while 35% switch over to B. Of those who bought B the previous year, 55% buy it again and 45% switch over to A. Find their market shares after one year and when is the equilibrium reached?

26) Integrate the following with respect to x. $\left(9x^2 - \frac{4}{x^2}\right)^2$

27) Integrate the following with respect to x. $\frac{1}{\sqrt{x+1} + \sqrt{x-1}}$

28) Integrate the following with respect to x

$\frac{3x+2}{(x-2)(x-3)}$

29) Integrate the following with respect to x.

$\frac{e^{3x} - e^{-3x}}{e^x}$

30)

Integrate the following with respect to x.

$$e^x \left[\frac{1}{x^2} - \frac{2}{x^3} \right]$$

ANSWER ANY 7

7 x 3 = 30

31)

Find the rank of the matrix $\begin{pmatrix} 1 & 2 & -1 & 3 \\ 2 & 4 & 1 & -2 \\ 3 & 6 & 3 & -7 \end{pmatrix}$

32) Show that the equations $2x+y=5, 4x+2y=10$ are consistent and solve them.

33) Find k, if the equations $x+2y-3z=-2, 3x-y-2z=1, 2x+3y-5z=k$ are consistent.

34) Consider the matrix of transition probabilities of a product available in the market in two brands A and B.

$$\begin{matrix} & \begin{matrix} A & B \end{matrix} \\ \begin{matrix} A \\ B \end{matrix} & \begin{pmatrix} 0.9 & 0.1 \\ 0.3 & 0.7 \end{pmatrix} \end{matrix}$$

Determine the market share of each brand in equilibrium position.

35) Akash bats according to the following traits. If he makes a hit (S), there is a 25% chance that he will make a hit his next time at bat. If he fails to hit (F), there is a 35% chance that he will make a hit his next time at bat. Find the transition probability matrix for the data and determine Akash's long- range batting average.

36) Evaluate $\int \frac{2x^2 - 14x + 24}{x^3 - 3x^2 - 4x} dx$

37) Evaluate $\int x^3 \log x dx$

38) Evaluate $\int \frac{dx}{\sqrt{x^2 + 4x + 8}}$

39) Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin x}{\sin x + \cos x} dx$

40) Evaluate $\int_2^5 \frac{\sqrt{x}}{\sqrt{x} + \sqrt{7-x}} dx$

7 x 5 = 70

41) a) Evaluate $\int \frac{3x+2}{(x-2)^2(x-3)} dx$

(OR)

b) Evaluate $\int \frac{(x^2+1) dx}{(x-1)^2(x+3)}$

42) a) If $\int_a^b dx = 1$ and $\int_a^b x dx = 1$, then find a and b

(OR)

b) Evaluate $\int_1^4 f(x) dx$, where $\begin{cases} 7x+3, & \text{if } 1 \leq x \leq 3 \\ 8x, & \text{if } 3 \leq x \leq 4 \end{cases}$

43) a) Evaluate $\int \frac{3x^2 + 6x + 1}{(x+3)(x^2+1)} dx$

(OR)

b) Evaluate $\int \left[\frac{1}{\log x} - \frac{1}{(\log x)^2} \right] dx$

- 44) a) The price of 3 Business Mathematics books, 2 Accountancy books and one Commerce book is Rs840. The price of 2 Business Mathematics books, one Accountancy book and one Commerce book is Rs 570. The price of one Business Mathematics book, one Accountancy book and 2 Commerce books is Rs 630. Find the cost of each book by using Cramer's rule.

(OR)

- b) The sum of three numbers is 6. If we multiply the third number by 2 and add the first number to the result we get 7. By adding second and third numbers to three times the first number we get 12. Find the numbers using rank method
- 45) a) A new transit system has just gone into operation in a city. Of those who use the transit system this year, 10% will switch over to using their own car next year and 90% will continue to use the transit system. Of those who use their cars this year, 80% will continue to use their cars next year and 20% will switch over to the transit system. Suppose the population of the city remains constant and that 50% of the commuters use the transit system and 50% of the commuters use their own car this year,
- (i) What percent of commuters will be using the transit system after one year?
- (ii) What percent of commuters will be using the transit system in the long run?

(OR)

- b) Evaluate $\int_0^{\infty} x^2 e^{-x^3} dx$
- 46) a) A mixture is to be made of three foods A, B, C. The three foods A, B, C contain nutrients p, Q, R as shown below

Ounces per pound of Nutrient			
Food	P	Q	R
A	1	2	5
B	3	1	1
C	4	2	1

How to form a mixture which will have 8 ounces of P, 5 ounces of Q and 7 ounces of R? (Cramer's rule).

(OR)

- b) Using determinants, find the quadratic defined by $f(x) = ax^2 + bx + c$ if $f(1) = 0, f(2) = -2$ and $f(3) = -6$.
- 47) a) Evaluate $\int \frac{x^2 + 2x + 3}{x+1} dx$

(OR)

- b) For what values of k, the system of equations $kx + y + z = 1, x + ky + z = 1, x + y + kz = 1$ have
- (i) Unique solution
- (ii) More than one solution
- (iii) no solution
