CA Foundation

Quantitative Aptitude

Practice Batch

Sure Shot Questions

Your Maths Buddy

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Mathematics of Finance

Simple Interest

Que 1. **(MTP-18)**	A lent Rs.6000 to B for 2 years and 1500 to C for 4 years and received total interest of Rs.900 from both. The rate of interest of Rs.900 from both. The rate of interest, when simple interest method calculated. (a) 5% (b) 6% (c) 7.5% (d) 9%	
Que 2. **(MTP-18)**	A person deposited a sum of Rs.10,000 in a bank. After 2 years, he withdrew Rs.4,000 and at the end of 5 years, he received an amount of Rs.7,900; then the rate of simple interest is: (a) 6% (b) 5% (c) 10% (d) none of these	
Que 3. **(MTP-18)**	Certain sum of money borrowed at simple interest amount to Rs.2688 in three years and to Rs.2784 in four years at the rate per annum equal to (a) 7% (b) 6% (c) 5% (d) 4%	
Que 4. **(MTP-18)**	A sum of Rs.46,875 was lent out at simple interest and at the end of 1 year 8 months the total amount was Rs.50,000. Find the rate of interest percent per annum. (a) 5% (b) 6% (c) 4% (d) 8%	
Que 5. **(MTP-18)**	Rs.8,000 becomes Rs.10,000 in two years at simple interest. The amount that will become Rs.6,875 in 3 years at the same rate of interest is: (a) Rs.4,850 (b) Rs.5,000 (c) Rs.5,500 (d) Rs.5,275	

Que 6. **(MTP-18)**	A person borrows Rs.5,000 for 2 years at 4% p.a. simple interest. He immediately lends to another person at $6\frac{1}{4}$% p.a. for 2 years. Find his gain in the transaction per year: (a) Rs.112.50 (b) Rs.125 (c) Rs.225 (d) Rs.167.50	
Que 7. **(MTP-18)**	Two equal sums were lent out at 7% and 5% simple interest respectively. The interest earned on the two loans adds up to Rs.960 for four years. Find the sum lent out. (a) Rs.4000 (b) Rs.3000 (c) Rs.5000 (d) Rs.6000	
Que 8. **(MTP-18)**	A sum of money amounts to Rs.20,800 in 5 years and Rs.22720 in 7 years. Find the principle and rate of interest. (a) Rs.5000,6% (b) Rs.16000, 6% (c) Rs.80000, 8% (d) Rs.10000, 10%	
Que 9. **(MTP-18)**	If a simple interest on a sum of money at 6% p.a. for 7 tears is equal to twice of simple interest on another sum for 9 years at 5% p.a. The ratio will be (a) 2: 15 (b) 7: 15 (c) 15: 7 (d) 1: 7	
Que 10. **(MTP-18)**	A sum of money gets doubled in 5 years at X% simple interest. If the interest was Y%, the sum of money would have become ten-fold in thirty years. What is Y – X (in %) (a) 10 (b) 5 (c) 8 (d) none of the above	
Que 11. **(MTP-18)**	How much time would the simple interest on a certain sum be 0.125 times the principal at 10% per annum (a) $1\frac{1}{4}\ years$ (b) $1\frac{3}{4} years$ (c) $2\frac{1}{4} years$ (d) $2\frac{3}{4} years$	

Que 12. **(MTP-18)**	If the difference between the interests received from two different banks on Rs.5000 for 2 years is Rs.50 then the difference between these rates. (a) 0.25% (b) 0.40% (c) 0.50% (d) 0.75%	
Que 13. **(MTP-18)**	The rate of interest for the first 2 year is 3% per annum, for next 3 years is 8% per annum and for the period beyond 5 years, 10% per annum. If a man gets Rs.1520 as a simple interest for 6 years; how much money did he deposit? (a) Rs.3800 (b) Rs.3000 (c) Rs.4000 (d) None of these	
Que 14. **(MTP-18)**	In Simple interest if the principal is Rs.2,000 and the rate and time are roots of the equation $x^2 - 11x + 30 = 0$ (a) Rs.500 (b) Rs.600 (c) Rs.700 (d) Rs.800	
Que 15. **(MTP-18)**	An investor is saving to pay off an obligation of Rs.15,250 which will due in seven years, if the investor is earning 7.5% simple interest rate per annum, he must deposit Rs. ____ to meet the obligation. (a) Rs.8,000 (b) Rs.9,000 (c) Rs.10,000 (d) Rs,11,000	
Que 16. **(MTP-18)**	Rs.8,829 is invested into three different sectors in such a way that their amounts at 4% p.a. S.I after 5 years; 6 and 8 years are equal. Find each part of the sum. (a) Rs.3,069, Rs.2,970, Rs.2,790 (b) Rs.3,089, Rs.2,970, Rs.2,790 (c) Rs.3,609, Rs.2,970, Rs.2,790 (d) Rs. 3,069, Rs.2,960, Rs.2,760	

Que 17. **(MTP-18)**	Mr. A invested Rs. X in an organization, it amounts to Rs.150 at 5% p.a. S.I. and to Rs.100 at 3% p.a. S.I. Then the value of x is (a) Rs.70 (b) Rs.40 (c) Rs.25 (d) None of these	
Que 18. **(MTP-18)**	A certain sum of money amounts to Rs.5,000 in 5 years at 10% p.a. In how many years will it amount to Rs.6,000 at same rate of S.I p.a. (a) 10 years (b) 8 years (c) 6 years (d) None of these	
Que 19. **(MTP-18)**	Sachin deposited Rs.1,00,000 in his bank for 2 years at simple interest of 6%. How much interest would be he earns? How much final value of deposit (a) Rs.6,000, Rs.1,06,000 (b) Rs.15,000, Rs.1,15,000 (c) Rs.11,600, Rs.1,11,600 (d) Rs.12000, Rs,1,12,000	

Compound Interest

Que 20. **(MTP-18)**	A sum of Money doubles itself at compound interest in 10 years. In how many years will it become eight times (a) 10 (b) 30 (c) 40 (d) 35	
Que 21. **(MTP-18)**	The compound interest on a certain sum is Rs.209 simple interest is Rs.200 for 2 years. What is the rate per cent for 2 years? What is the rate percent? (a) 9% (b) 18% (c) 4.5% (d) 10%	
Que 22. **(MTP-18)**	Rs.10,000 is invested at annual rate of interest of 10% p.a. The amount after two years at annual compounding is (a) Rs.21100 (b) Rs.12100 (c) Rs.12110 (d) None of these	

Que 23. **(MTP-19)**	The annual birth rate and death rate per 1000 are 39.4 and 19.4 respectively. The number of years in which population will be doubled assuming that there is no immigration or emigration is approximately (a) 40 years (b) 30 years (c) 36 years (d) 25 years	
Que 24. **(MTP-19)**	The difference between CI and SI on a certain money invested for three years at 6% per annum is Rs.110.16. The sum is (a) Rs.3000 (b) Rs.3700 (c) Rs.12000 (d) Rs.10000	
Que 25. **(MTP-19)**	If A person invests Rs.3,000 in a three years investment that pays you 12% per annum. Calculate the future value of the investment. (a) Rs.4214.78 (b) Rs.4124.78 (c) Rs. 4324.48 (d) Rs. 4526.48	
Que 26. **(MTP-20)**	The time by which a sum of money would treble itself at 8% p.a C.I is (a) 14.28 years (b) 14 years (c) 12 years (d) none of these	
Que 27. **(MTP-20)**	The difference between the simple and compound interest on a certain sum for 3 years at 5% p.a is Rs.228.75. The compound interest on the sum for 2 years at 5% p.a is: (a) Rs.3,175 (b) Rs.3,075 (c) Rs.3,275 (d) Rs.2,975	
Que 28. **(MTP-21)**	If A person invests Rs.5,000 in a three years investment that pays you 12% per annum. Calculate the future value of the investment. (a) Rs.7024.64 (b) Rs.7124.78 (c) Rs.7324.48 (d) Rs.7526.48	

Que 29. **(MTP-18)**	Rs.10,000 is invested at annual rate of interest of 10% p.a. The amount after two years at annual compounding is (a) Rs.21100 (b) Rs.12100 (c) Rs.12110 (d) None of these	
Que 30. **(MTP-21)**	What will be population after 3 years when present population is 25,000 and population increase at the rate of 3% in first year, at 4% in second year and at 5% in third year? (a) 28,119 (b) 29,118 (c) 30,100 (d) 27,100	
Que 31. **(MTP-21)**	The nominal rate of growth is 17% and inflation is 9% for the five years. Let P be the Gross Domestic Product (GDP) amount at the present year then the projected real GDP after 6 years is (a) 1.587P (b) 1.921P (c) 1.403P (d) 2.51P	
Que 32. **(PYQ-25)**	If the compound interest on a certain sum for 2 years at 5% per annum is 246, then the simple interest on the same sum for double the time and double the rate per annum is: (a) ₹ 900 (b) ₹ 960 (c) ₹ 1,000 (d) ₹ 1,100	

Effective Rate

Que 33. **(MTP-18)**	The effective rate of interest is an amount Rs.25,000 is deposited in a bank for one year at value of 6% per annum compounded semi-annually is (a) 5.99% (b) 5.95% (c) 6.09% (d) 6.90%	
Que 34. **(MTP-18)**	If the effective interest is 12% per annum and the interest is compounded quarterly, the nominal interest per annum is. (a) 11.78% (b) 11.21% (c) 11.89% (d) 11.49%	

Depreciation

Que 35. **(MTP-18)**	A machine worth of Rs.4,90,740 is depreciated at 15% on its opening value each year. When its value reduces to Rs.2,00,000 (a) 5 years 6 months (b) 5 years 7 months (c) 5 years 5 months (d) none	
Que 36. **(MTP-18)**	The value of a machine depreciates 12% annually. If the present value of Rs.68,150 then its value in 3 years ago was. (a) Rs.1,10,000 (b) Rs.1,00,004 (c) Rs.92,000 (d) Rs.97,000	
Que 37. **(MTP-18)**	A machine depreciated at the rate of 20% on reducing balance. The original lot of the machine was Rs.1,00,000 and ultimate scrap value is Rs.30,000. The effective life of the machine in years is. (a) 4.5 (b) 5.4 (c) 4.9 (d) 5	
Que 38. **(MTP-21)**	A Maruti Zen cost Rs.3,60,000. Its price depreciates at the rate of 10% of a year during the first two years and at the rate of 20% in third year. Find the total depreciation. (a) Rs.1,26,720 (b) Rs.1,15,620 (c) Rs.1,25,000 (d) Rs.1,10,520	
Que 39. **(MTP-22)**	Present value of a scooter is Rs.7290, if its value decreases every year by 10% then the value before 3 years is equal to (a) 10,000 (b) 10,500 (c) 20,000 (d) 20,500	

Present Value

Que 40. **(MTP-18)**	Rs.10,000 is paid every year to off a loan, the loan amount if interest be 14% per annum compounded annually is (a) Rs.5216.11 (b) Rs.1917.13 (c) Rs.52,161.1 (d) Rs.19,171,3	
Que 41. **(MTP-18)**	The present value of Rs.1 to be receive after 3 year compounded annually at 11% interest is (a) 0.713 (b) 0.811 (c) 0.731 (d) 0.658	
Que 42. **(MTP-18)**	Find the present value of Rs.10,000 to be required after 5 years, if the interest be 9%. Given $(1.09)^5 = 1.5386$ (a) Rs.6500 (b) Rs.6499.42 (c) Rs.6600.52 (d) Rs.6700.52	
Que 43. **(MTP-18)**	Sanjana borrows Rs.5,00,000 to buy a house. If she pays equal installments for 20 years and 10% interest on outstanding balance what will be the equal annual installment? ([P(20, 0.10) = 8.51356) (a) Rs.58,729.84 (b) Rs.58,792.54 (c) Rs.85,729.54 (d) Rs.85,792.45	
Que 44. **(MTP-18)**	X bought a TV costing 25,000 making down payment of Rs.5000 and agreeing to make equal annual payment for four years. How much would be each payment if the interest on unpaid amount be 14% compounded annually? [P(4, 0.14) = 2.91731] (a) Rs.6855.63 (b) Rs.6850.63 (c) Rs.6859 (d) Rs.6871	

Que 45. **(MTP-19)**	Suppose your friend decided gift to you Rs.10000 every year starting from today for the next five years. Your deposit this amount in a bank as ad when you receive and get 10% per annum interest compounded annually. What is the present value of this annuity? (a) Rs.42698.70 (b) Rs.43698.70 (c) Rs.45698.70 (d) Rs.41698.70	
Que 46. **(MTP-19)**	Anil bought a motor cycle costing Rs.1,30,000 by making a down payment of Rs.30,000 and agreeing to make equal annual payment for five years. How much would be each payment if the interest on unpaid amount be 10% compounded annually? [P(5,0.10) = 3.7908] (a) Rs.28379.70 (b) Rs.26300.70 (c) Rs.26500.70 (d) Rs.26379.70	
Que 47. **(MTP-19)**	An overdraft of Rs.50,000 to be paid back in equal annual installments over a period of 20 years. Find the value of installment, if interest is compounded annually at 14% per annum. [Given $(1.14)^{20} = 13.74349$] (a) Rs.550.50 (b) Rs.549.30 (c) Rs.559.50 (d) Rs.560.50	
Que 48. **(MTP-20)**	The present value of an annuity of Rs.80 for 20 years at 5% p.a is [$Given$ $(1.05)^{20} = 2.6533$] (a) Rs.997 (appx.) (b) Rs.900 (c) Rs.1,000 (d) none of these	
Que 49. **(MTP-21)**	Arun purchased a vacuum cleaner by giving Rs.1700 as cash down payment, which will be followed by five EMIs of Rs.480 each. The vacuum cleaner can also be bought by paying Rs.3900 cash. What is the approx. rate of interest p.a. (at simple interest) under this installment plan? (a) 18% (b) 19% (c) 22% (d) 20%	

Que 50. **(MTP-21)**	Present value of a five-year annuity is Rs.2,000. If the rate of interest is 8% p.a., what is the amount of each annuity payment? (a) Rs.500.9 (b) Rs.463.8 (c) Rs.363.1 (d) Rs.486.4	
Que 51. **(MTP-21)**	Abdul has taken a loan from Bahadur at 7% p.a. The loan has to be repaid in three equal yearly installments of Rs.10,000 each. What is the amount of loan taken? (a) Rs.25,467 (b) Rs.26,897 (c) Rs.26,243 (d) None of the above	
Que 52. **(MTP-23)**	Paul borrows Rs.20,000 on condition to repay it with compound interest at 5% p.a. in annual instalment of Rs.2,000 each. Find the number of years in which the debt would be paid off. (a) 10 years (b) 12 years (c) 14 years (d) 15 years	

Future Value

Que 53. **(MTP-18)**	A sinking fund is created redeeming debenture worth Rs.5,00,000 at the end of 25 years. How much provision need to be made out of profits each year provided sinking fund investments can earn at 4% per annum (a) 12,006 (b) 12,040 (c) 12039 (d) 12035	
Que 54. **(MTP-18)**	Rs.500 is invested is invested at the end of each month is an account paying interest 8% per year compounded monthly. The future value of annuity after 10^{th} payment is $(1.08)^{10} = 2.15893$ (a) Rs.7243.31 (b) Rs.7423.30 (c) Rs.3451.50 (d) Rs.3541.50	

Que 55. **(MTP-19)**	At six months intervals A deposited of Rs.1000 in a savings account which credit interest at 10% p.a., compounded semi-annually. The first deposit was made when A's son was 6 months old and last deposit was made when his son was 8 years old. The money remained in the account and was presented to the son on his 10^{th} birthday. How much did he receive? [$(1.06)^{16} = 2.1829$] (a) Rs.25740 (b) Rs.23740 (c) Rs.25860 (d) Rs.25760	
Que 56. **(MTP-21)**	How much money is to be invested every year so too accumulate Rs.3,00,000 at the end of 10 years if interest is compounded annually at 10% [A(10,0.1)=15.9374] (a) Rs.18823.65 (b) Rs.18833.64 (c) Rs.18223.60 (d) Rs.16823.65	
Que 57. **(MTP-22)**	Mr. invests Rs.10,000 every year starting from today for next 10 years suppose interest rate is 8% per annum compounded annually. Calculate future value of the annuity: (Given that $(1 + 0.08)^{10} = 2.158925$) (a) Rs.156454.88 (b) Rs.144865.625 (c) Rs.156554.88 (d) none of these	
Que 58. **(MTP-22)**	Rajesh deposits Rs.3,000 at the start of each quarter in his savings account. If the account earns interest 5.75% per annum compounded quarterly, how much money (in Rs) will he have at the end of 4 years? [Given that $(1.014375)^{16} = 1.25654$] (a) Rs.54,308.6 (b) Rs.58,553.6 (c) Rs.68,353.6 (d) Rs.63,624.4	

Que 59. **(MTP-22)**	Rajesh invests Rs.20,000 per year in a stock index fund, with earns 9% per year, for the next ten years. What would be closest value of accumulated investment upon payment of the last installment? [Given: $(1.09)^{10} = 2.36736$] (a) Rs.3,88,764.968 (b) Rs.3,03,858.564 (c) Rs.2,68,728.484 (d) Rs.4,08,718.364	
Que 60. **(MTP-22)**	How much amount is required to be invested every year as to accumulate Rs.6,00,000 at the end of 10 years, if interest is compounded annually at 10% rate of interest [Given:$(1.1)^{10} = 2.59374$]. (a) Rs.37,467 (b) Rs.37,476 (c) Rs.37,647 (d) Rs.37,674	
Que 61. **(MTP-24)**	Invests Rs.10,000 every year starting from today for next 10 years. Suppose interest rate is 8% per annum compounded annually calculate future value of the annuity Given that $(1 + 0.08)^{10} = 2.15892500$ (a) Rs.156454.875 (b) Rs.156484.875 (c) Rs.144865.625 (d) None of these	

Sinking Fund

Que 62. **(MTP-24)**	A company establishes a sinking fund to provide for the payment of Rs.2,00,000 debt maturing in 20 years. Contributions to the fund are to be made at the end of every year. Find the amount of each annual deposit if interest is 5% per annum: (a) Rs.6,142 (b) Rs.6,049 (c) Rs.6,052 (d) Rs.6,159	

Perpetual Annuity

Que 63. **(MTP-18)**

Assuming that the discount rate is 7% per annum, how much would you pay to receive Rs.50, growing at 5% annually forever?

(a) 2,600 (b) 2,000

(c) 2,500 (d) 3,000

Que 64. **(MTP-24)**

The value of the present value of a sequence of payments of Rs.80 made at the end of each 6 months and continuity forever, if money is worth 4% compounded semi-annually is....

(a) Rs.4,000 (b) Rs.5,000

(c) Rs.3,000 (d) None of these

Capital Expenditure

Que 65. **(MTP-18)**

A machine can be purchased for Rs.50,000. Machine will contribute Rs.12,000 per year for the next five years. Assume borrowing cost is 10% per annum compounded annually. Determine whether machine would be purchased or not?

(a) Purchased

(b) Not purchased

(c) Profitable

(d) None of the above

Net Present Value

Que 66. **(MTP-21)**

If the cost of capital be 12% per annum, then the Net Present Value (in nearest Rs.) from the given cash flow is given as

Year	0	1	2	3
Operating profit (in thousand Rs.)	100	60	40	50

(a) Rs.34048 (b) Rs.34185

(c) Rs.51048 (d) Rs.21048

Leasing Decision

Que 67.

(MTP-19)

A company is considering proposal of purchasing a machine either by making full payment of Rs.4000 or by leasing it for four years at an annual rate of Rs.1250. Which course of action is preferable if the company can borrow money at 14% compounded annually? [P(4,0.14) = 2.9137]

(a) leasing is not preferable

(b) leasing is preferable

(c) cannot be determined

(d) none of these

Valuation Of Bond

Que 68.

(MTP-23)

Find the purchase price of a Rs.1000 bond redeemable at the paying annual dividends at 4% if the yield rate is to be 5% effective.

(a) Rs.884.16 (b) Rs.984.17

(c) Rs.1084.16 (d) None of these

Que 69.

(MTP-23)

A Rs.1000 bond paying annual dividends at 8.5% will be redeemed at par at the end of 10 years. Find the purchase price of this bond if the investor wishes a yield rate of 8%.

(a) Rs.907.135

(b) Rs.1033.54

(c) Rs.945.67

(d) None of these

Compound Annual Growth Rate (CAGR)

Que 70.

(MTP-21)

Let the operating profit of a manufacturer for five years is given as

Year	Operating Profit (*in lakhs Rs.*)
1	90
2	100
3	106.4
4	107.14
5	120.24
6	157.35

Calculate Compound Annual Growth Rate (CAGR)

(a) 9% (b) 12%

(c) 11% (d) 13%

Que 71. **(MTP-22)**	Ravi made of an investment of Rs.15,000 in a scheme and at the time of maturity the amount was Rs.25,000. If Compounded Annual Growth Rate (CAGR) for this investment is 8.88%. Calculate the approximate number of years for which he has invested the amount. (a) 6 (b) 7.7 (c) 5.5 (d) 7

EQUATIONS

In One Variable		
Que 1. **(MTP-21)**	Given the Quadratic equation $\frac{x-1}{x} - \frac{x}{x+1} = \frac{3}{2}$ (a) 1 and -2/3 (b) -1 and 2/3 (c) -1 and -2/3 (d) 1 and 2/3	
Que 2. **(MTP-22)**	$\frac{2x+5}{10} + \frac{3x+10}{15} = 5$, then value of x (a) 10.58 (b) 9.58 (c) 9.5 (d) none of these	
In Two Variable		
Que 3. **(MTP-20)**	If $2x - 3y = 1$ *and* $5x + 2y = 50$, then what is the value of (x – 2y)? (a) -2 (b) 6 (c) 7 (d) 10	
Que 4. **(MTP-21)**	The point of intersection between the lines $3x + 4y = 7$ and $4x - y = 3$ lie in the (a) 1^{st} *quadrant* (b) 2^{nd} *quadrant* (c) 3^{rd} *quadrant* (d) 4^{th} *quadrant*	
Que 5. **(PYQ-16)**	If, $2^{x+y} = 2^{2x-y} = \sqrt{8}$ then the respective values of X and Y are —. (a) $1, \frac{1}{2}$ (b) $\frac{1}{2}, 1$ (c) $\frac{1}{2}, \frac{1}{2}$ (d) None of these.	
Finding roots of equations		
Que 6. **(PYQ-20)**	If $2x^2$ - (a + 6)2x + 12a - 0, then the roots are: (a) 6 and a (b) 4 and a2 (c) 3 and 2a (d) 6 and 3a	

Problem Based on Nature of Roots		
Que 7. **(MTP-18)**	The equation $x^2 - (P+4)x + 2P + 5 = 0$ has equal roots. The value of p is (a) 2 (b) -2 (c) ± 2 (d) 3	
Que 8. **(MTP-20)**	The roots of the quadratic equation $x^2 - 4x + k = 0$ are coincident if (a) k = 4 (b) k = 3 (c) k = 2 (d) k = 1	
Que 9. **(MTP-20)**	The roots of the equation $x^2 + (2p-1)x + p^2 = 0$ are real if (a) p ≥ 1 (b) p ≤ 4 (c) p ≥ ¼ (d) p ≤ ¼	
Que 10. **(MTP-21)**	The roots of the equation $x^2 - x + 1 = 0$ are (a) Imaginary and unequal (b) Real and unequal (c) Real and equal (d) Imaginary and equal	
Que 11. **(MTP-23)**	If the roots of $(k-4)x^2 - 2kx + (k+5) = 0$ are coincident. Then the value of k? (a) 14 (b) 20 (c) 18 (d) 22	

Que 12. **(PYQ-15)**	If the roots of the equation $4x^2 - 12x + k = 0$ are equal, then the value of k is: (a) -3 (b) 3 (c) -9 (d) 9	
Problem Based on Property of Roots		
Que 13. **(MTP-18)**	If α and β are the roots of the equation $3x^2 - 5x + 3 = 0$ then the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ is (a) 7/9 (b) -7/9 (c) 8/9 (d) -8/9	
Que 14. **(MTP-19)**	Let α and β be the roots of equation $x^2 + 7x + 12 = 0$. Then the value of $\left(\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}\right)$ will be (a) $\left(\frac{49}{144} + \frac{144}{49}\right)$ (b) $\left(\frac{7}{12} + \frac{12}{7}\right)$ (c) $\left(-\frac{91}{12}\right)$ (d) none of these	
Que 15. **(MTP-19)**	If α and β be the roots of the equation $2x^2 - 4x - 3 = 0$ the value of $\alpha^2 + \beta^2$ is (a) 5 (b) 7 (c) 3 (d) -4	

Que 16. (MTP-22)	Roots of the equation $2x^2 + 3x + 7 = 0$ are α and β then the value of $\alpha\beta^{-1} + \beta\alpha^{-1}$ is (a) 2 (b) 3/7 (c) 7/2 (d) -19/14	
Que 17. (MTP-22)	If roots of equation $x^2 + x + r = 0$ are α and β and $\propto^3 + \beta^3 = -6$. Find the value of 'r' (a) -5/3 (b) 7/3 (c) -4/3 (d) 1	
Equation Forming Problem		
Que 18. (MTP-18)	Find the quadratic equation given that $5 + \sqrt{3}$ is one root (a) $x^2 - 10x + 22 = 0$ (b) $x^2 + 10x - 22 = 0$ (c) $x^2 - 10x - 22 = 0$ (d) $-x^2 - 10x + 22 = 0$	
Que 19. (MTP-21)	If α and β are the roots of the equation $x^2 + 7x + 12 = 0$, then the equation whose roots $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$ will be (a) $x^2 - 14x + 49 = 0$ (b) $x^2 - 24x + 144 = 0$ (c) $x^2 - 50x + 49 = 0$ (d) $x^2 - 19x + 49 = 0$	

Que 20. (MTP-23)	If arithmetic mean between roots of a quadratic equation is 8 and the geometric mean between them is 5, the equation is_____. (a) $x^2 - 16x - 25 = 0$ (b) $x^2 - 16x + 25 = 0$ (c) $x^2 - 16x + 5 = 0$ (d) None of these.	
Que 21. (MTP-24)	If α, β are the roots of the quadratic equation $3x^2 - 4x + 1 = 0$; the equation having roots $\frac{\alpha^2}{\beta}, \frac{\beta^2}{\alpha}$ (a) $9x^2 - 28x + 3 = 0$ (b) $9x^2 - 28x + 1 = 0$ (c) $9x^2 - 28x + 5 = 0$ (d) None of these.	
Que 22. (PYQ-15)	If $\alpha + \beta = -2$ and $\alpha\beta = -3$. then α, β are the roots of the equation, which is: (a) $x^2 - 2x - 3 = 0$ (b) $x^2 + 2x - 3 = 0$ (c) $x^2 + 2x + 3 = 0$ (d) $x^2 - 2x + 3 = 0$	
Que 23. (PYQ-21)	If one root is half of the other of a quadratic equation and the difference in roots is a, then the equation is (a) $x^2 + ax + 2a^2 = 0$ (b) $x^2 - 3ax - 2a^2 = 0$ (c) $x^2 - 3ax + 2a^2 = 0$ (d) $x^2 + 3ax - 2a^2 = 0$	

Word Problems		
Que 24. (MTP-18)	A number consists of three digits of which the middle one is zero and the sum of other digits is 9. The number formed by interchanging the first and third digits is more than the original number by 297 find the number? (a) 306 (b) 309 (c) 603 (d) 307	
Que 25. (MTP-18)	The age of a person is twice the sum of the ages of his two sons and five years ago his age was thrice the sum of their ages. Find his present age. (a) 60 years (b) 52 years (c) 51 years (d) 50 years	
Que 26. (MTP-19)	If thrice of A's age 6 years ago be subtracted from twice his present age, the result would be equal to his present age. Find A's Age (a) 9 (b) 8 (c) 10 (d) 12	
Que 27. (MTP-20)	Three persons Mr. Roy, Mr. Paul and Mr. Singh together have Rs.51. Mr. Paul has Rs.4 less than Mr. Roy and Mr. Singh has got Rs.5 less than Mr. Roy. They have the money as. (a) (Rs.20, Rs.16, Rs.15) (b) (Rs.15, Rs.20, Rs.16) (c) (Rs.25, Rs.11, Rs.15) (d) none of these	
Que 28. (MTP-21)	X and Y have their present ages in the ratio 6 : 7. 14 years ago, the ratio of the ages of the two was 4 : 5. What will be the ratio of their ages 21 years from now? (a) 7 : 11 (b) 9 : 10 (c) 8 : 11 (d) 11 : 13	

Que 29. (MTP-22)	A man wants to cut three lengths from a single piece of board of length 91cm. The Second length is to be 3cm longer than the shortest and third length is to be twice as the shortest. What is the possible length for the shortest piece? (a) 22 (b) 20 (c) 15 (d) 18	
Que 30. (MTP-23)	If difference between a number and its positive square root is 12; the numbers are (a) 9 (b) 16 (c) 25 (d) None of these	
Que 31. (MTP-23)	A box contains 276 coins of 5 rupees, 2 rupees and 1 rupee. The value of each kind of coins are in the ratio 2:3:5 respectively. The number of 2 rupees coin is (a) 52 (b) 60 (c) 76 (d) 85	
Que 32. (PYQ-15)	A person on a tour has Rs. 9,600 for his expenses. If his tour is extended by 16 days, he has to cut down his daily expenses by Rs. 20, his original duration of tour had been. (a) 48 days (b) 64 days (c) 80 days (d) 96 days	

Advanced Problems		
Que 33. (MTP-19)	When two roots of quadratic equations are α and $\frac{1}{\alpha}$ then what will be quadratic equation. (a) $\alpha x^2 - (\alpha^2 + 1)x + \alpha = 0$ (b) $\alpha x^2 - \alpha^2 x + \alpha = 0$ (c) $\alpha x^2 - (\alpha^2 + 1)x + \alpha = 0$ (d) none of these	
Que 34. (MTP-21)	The value of $\sqrt{6 + \sqrt{6 + \sqrt{6+\ldots\ldots\ldots\infty}}}$ is (a) -3 (b) 2 (c) 3 (d) 4	
Que 35. (MTP-21)	The roots of equation $9^{x+2} - 6.3^{x+1} + 1 = 0$ are (a) -2 (b) 2 (c) $\sqrt{2}$ (d) 0	
Que 36. (MTP-21)	The cab bill is partly fixed and partly varies on the distance covered. For 456 km the bill is Rs.8252, for 484 km the bill is Rs.8728. What will the bill be for 500km? (a) Rs.8876 (b) Rs.9156 (c) Rs.9472 (d) Rs.9000	

Que 37. (MTP-22)	If the ratio of the roots of the equation $4x^2 - 6x + p = 0$ is 1:2 then the value of p is: (a) 1 (b) 2 (c) -2 (d) -1	
Que 38. (MTP-23)	In a hostel ration stocked for 400 students upto 31 days. After 28 days 280 students were vacated the hostel. Find the number of days for which the remaining ratio will be sufficient for the remaining students. (a) 5 (b) 4 (c) 7 (d) 10	
Que 39. (MTP-24)	Aman walks a certain distance with certain speed. If he walks 1/2 km an hour faster, he takes 1 hour less. But, if he walks 1 km an hour slower, he takes 3 more hours. Find the distance covered by the man and his original rate of walking. (a) 36 km, 4 km/hr (b) 40 km, 10 km/hr 3 (c) 50 km, 20 km/hr (d) None of these	
Que 40. (PYQ-19)	Find the condition that one roots is double the other of $ax^2 + bx + c = 0$ (a) $2b^2 = 3ac$ (b) $b^2 = 3ac$ (c) $2b^2 = 9ac$ (d) $2b^2 > 9ac$	
Que 41. (PYQ-19)	Find value of $x^2 - 10x + 1$ if $x = \frac{1}{5-2\sqrt{6}}$ (a) 25 (b) 1 (c) 0 (d) 49	

Que 42. (PYQ-21)	The harmonic mean of the roots of the given equation is $(5+\sqrt{2})\,x^2 - (4+\sqrt{5})\,x + 8 + 2\sqrt{5} = 0$ (a) 2 (b) 4 (c) 6 (d) 8	
Cubic Equation		
Que 43. (MTP-18)	The roots of the equation $x^3 + x^2 - 20x = 0$ (a) 0, 4, 5 (b) 0, -4, 5 (c) 0, 4, -5 (d) 0, -4, -5	
Que 44. (MTP-22)	Roots of the equation $x^3 + 9x^2 - x - 9 = 0$. (a) 1,2,3 (b) 1,-1,-9 (c) 2,3,-9 (d) 1,3,9	
Formation Of Cubic Equation from Given Factors		
Que 45. (MTP-18)	If α, β, γ are the roots of equation $x^3 - 4x^2 + x + 6$ then the equation roots are $\frac{1}{\alpha}, \frac{1}{\beta}\ and\ \frac{1}{\gamma}$ is (a) $x^3 - 4x^2 + x + 6 = 0$ (b) $4x^3 - 6x^2 + x - 1 = 0$ (c) $6x^3 + x^2 - 4x + 1 = 0$ (d) $6x^3 - x^2 + 4x - 1 = 0$	

Permutation & Combination

Problem Based on Word's

Que 1. (MTP-18)	In how many ways can the letters of words "ACCOUNTANT" be arranged if vowels always occur together? (a) 7560 (b7650 (c) 7660 (d) 7550	
Que 2. (MTP-19)	In how many ways the letters of the word 'ARRANGE' be arranged? (a) 1,200 (b) 1,250 (c) 1,260 (d) 1,300	
Que 3. (MTP-19)	In how many ways can the letters of the word 'STRANGE' be arranged so that the vowels never come together? (a) 3600 (b) 3686 (c) 5040 (d) 4050	
Que 4. (MTP-21)	Find the number of combinations of the letters of the word COLLEGE taken four together: (a) 18 (b) 16 (c) 20 (d) 26	
Que 5. (MTP-22)	Find the number of even numbers greater than 100 that can be formed with the digits 0,1,2,3? (a) 10 (b) 15 (c) 20 (d) None of these	
Que 6. (MTP-22)	In how many ways can the letters of the word "ALEGEBRA" be arranged without changing the relative order of the vowels? (a) 82 (b) 70 (c) 72 (d) None of these	
Que 7. (MTP-22)	In how many ways can the letters of the word "DIRECTOR" be arranged so that the three vowels are never together? (a) 180 (b) 18,000 (c) 18,002 (d) None of these	

Que 8. (MTP-22)	How many words can be formed with the letters of the word 'ORIENTAL.' So that A and E always occupy odd places: (a) 540 (b)8460 (c) 8640 (d) 8450	
Que 9. (MTP-23)	The number of words from the letters of the word BHARAT, in which B and H will never come together is (a) 360 (b) 240 (c) 120 (d) None of these	
Que 10. (PYQ-22)	If four letter words are taken with or without meaning from the word 'Logarithm' without repetition, how many words will be formed? (a) 5040 (b) 2520 (c) 3024 (d) 40320	
Problem Based on Numbers		
Que 11. (MTP-18)	The sum of all the 4 digits numbers that can be formed with the digits 3, 4, 5, 5 is (a) 18887 (b) 33333 (c) 38887 (d) 56661	
Que 12. (MTP-22)	How many numbers can be formed with the help of 2,3,4,5,6,1 which is not divisible by 5, given that it is a five-digit number and digits are not repeating? (a) 1200 (b) 400 (c) 600 (d) 1400	
Que 13. (MTP-23)	The number of 3-digit odd numbers can be formed using the digits 5,6,7, 8, 9. If repetition is allowed? (a) 56 (b) 75 (c) 95 (d) 45	
Que 14. (MTP-23)	How many numbers of 3 digits can be made by using digits 3,5,6,7 *and* 8. No. digit being repeated. (a) 120 (b) 60 (c) 100 (d) None of these	

Que 15. (PYQ-16)	The number of numbers between 1,000 and 10,000, which can be formed by the digits 1, 2, 3, 4, 5, 6 without repetition is: (a) 720 (b) 180 (c) 360 (d) 540	
Que 16. (PYQ-21)	How many numbers of seven-digit numbers which can be formed from the digits 3, 4, 5, 6, 7, 8, 9 no digits being repeated are not divisible by 5? (a) 4320 (b) 4690 (c) 3900 (d) 3890	
	Problem Based on Geometry	
Que 17. (MTP-18)	A polygon has 44 diagonals then the number of sides are (a) 6 (b) 7 (c) 8 (d) 9	
Que 18. (MTP-19)	The number of diagonals in a polygon of 6 sides (a) 9 (b) 8 (c) 6 (d) 12	
Que 19. (MTP-20)	The number of triangles that can be formed by choosing the vertices from set of 12 points, seven of which lie on the same straight line is (a) 185 (b) 175 (c) 115 (d) 105	
Que 20. (PYQ-17)	The number of parallelograms formed from a set of six parallel lines intersecting another set of four parallel lines is: (a) 360 (b) 90 (c) 180 (d) 45	

Circular Permutation		
Que 21. (MTP-22)	In how many ways can a party of 4 men and 4 women be seated at a circular table, so that no two women are adjacent? (a) 164 (b) 174 (c) 144 (d) 154	
Que 22. (PYQ-22)	The number of ways 5 boys and 5 girls can be seated at a round table, so no two boys are adjacent is: (a) 2,550 (b) 2,880 (c) 625 (d) 2,476	
Based on Theorems		
Que 23. (MTP-19)	A man has 5 friends. In how many ways can be invite one or more of his friends to dinner? (a) 30 (b) 31 (c) 32 (d) 10	
Que 24. (MTP-20)	An examination paper with 10 questions consists of 6 questions in Algebra and 4 questions in Geometry. At least one question from each section is to be attempted. In how many ways can this be done? (a) 945 (b) 100 (c) 1000 (d) none of these	
Que 25. (MTP-20)	In an examination a candidate has to pass in each of the 4 papers. In how many different ways can be failed? (a) 14 (b) 16 (c) 15 (d) none of these	

Que 26. (MTP-20)	In an election the number of candidates is one more than the number of members to be elected. If a voter can vote in 254 different ways; find the number of candidates. (a) 8 (b) 10 (c) 7 (d) none of these	
Que 27. (MTP-21)	A boy has 3 library tickets and 8 books of his interest in the library of these 8, he does not want to borrow mathematics part II unless mathematics part-1 is also borrowed? In how many ways can he choose the three books to be borrowed? (a) 41 (b) 51 (c) 61 (d) 71	
Que 28. (MTP-21)	$5_{C_1} + 5_{C_2} + 5_{C_3} + 5_{C_4} + 5_{C_5}$ is equal to _____ (a) 30 (b) 31 (c) 32 (d) 35	
Que 29. (MTP-21)	In how many ways 3 Prizes can be distributed among 3 students equally (a) 10 (b) 45 (c) 60 (d) 120	
Que 30. (MTP-22)	Three girls and five boys are to be seated in a row so that no two girls sit together. Total no. of arrangements is: (a) 14,400 (b) 120 (c) 5P3 (d) 3! × 5!	
Que 31. (MTP-23)	The number of ways of 4 boys and 3 girls are to be seated for a photograph in a row alternatively. (a) 24 (b) 164 (c) 144 (d) 336	

Que 32. (MTP-24)	The number of ways that 12 prizes can be divided among 4 students so that each may have 3 prizes is: (a) 15,400 (b) 15,000 (c) 14,400 (d) 369600	
Que 33. (MTP-24)	Five balls of different colors are to be placed in three boxes of different sizes. Each box can hold all the five balls. In how many different ways can we place the balls so that no box remains empty? (a) 100 (b) 120 (c) 150 (d) None of these	
Que 34. (PYQ-22)	The number of ways 4 boys and 3 girls can be seated in a row so that they are alternate is: (a) 12 (b) 288 (c) 144 (d) 256	

Miscellaneous

Que 35. (MTP-18)	How many Six-digit telephone numbers can be formed by using 10 distinct digits (a) 10^8 (b) 6^{10} (c) $10C_9$ (d) $10P_6$	
Que 36. (MTP-18)	In a lawn different ways can four persons stand in a line for a group photograph. (a) 24 (b) 16 (c) 8 (d) 64	
Que 37. (MTP-18)	A company wishes top simultaneously promotes three of its 8 department assistant managers. In how many ways these promotions can take place? (a) 336 (b) 56 (c) 8 (d) 1680	

Que 38. (MTP-18)	From a committee of 8 persons, in how many ways can we choose a chairman and a vice chairman assuming one person cannot hold more than one position? (a) 50 (b) 56 (c) 62 (d) none of these	
Que 39. (MTP-18)	Four letters are written and 4 envelopes are addressed. The number of ways in which all the letters do not go into correct envelopes is (a) 511 (b) 1023 (c) 23 (d) 15	
Que 40. (MTP-19)	The number of ways in which 8 examination paper be arranged so that the best and worst papers never come together. (a) $8! - 2 \times 7!$ (b) $8! - 7!$ (c) $8!$ (d) $7!$	
Que 41. (MTP-19)	A box contains 7 red, 6 white and 4 blue balls. How many selections of three balls on of each colour? (a) 178 (b) 158 (c) 198 (d) 168	
Que 42. (MTP-20)	If 12 school teams are participating in a quiz contest, then the number of ways the first, second and third positions may be won is (a) 1,230 (b) 1,320 (c) 3,210 (d) none of these	

Que 43. (MTP-21)	A box contains 3 pink caps, 2 purple caps and 4 orange caps. In how many ways they can be arranged so that the caps of the same colour come together. (Assume all caps of same colour are not identical) (a) 1724 (b) 1728 (c) 1732 (d) 1764	
Que 44. (MTP-21)	There are 12 questions to be answered in Yes or No. how many ways can these be answered? (a) 1024 (b) 2048 (c) 4096 (d) none	
Que 45. (MTP-22)	The number of ways of arranging 6 boys and 4 girls in a row so that all 4 girls are together is: (a) 6!. 4! (b) 2(7! 4!) (c) 7! 4! (d) 2(6! 4!)	
Que 46. (MTP-22)	How many different groups of 3 people can be formed from a group of 5 people? (a) 5 (b) 6 (c) 10 (d) 9	
Que 47. (MTP-22)	In how many ways can 4 people be selected at random from 6 boys and 4 girls if there are exactly two girls? (a) 90 (b) 360 (c) 92 (d) 480	
Que 48. (MTP-23)	A bag contains 4 red, 3 black and 2 white balls. In how many ways 3 balls can be drawn from this bag so that they include at least one black ball? (a) 64 (b) 46 (c) 85 (d) None of the above	

Que 49. (MTP-23)	The maximum number of points of intersection of 10 circles will be: (a) 2 (b) 20 (c) 90 (d) 18	
Que 50. (MTP-23)	There are 5 books on English, 4 Books on Tamil and 3 books on Hindi. In how many ways can these books be placed on a shelf if the books on the same subjects are to be together? (a) 1,36,800 (b) 1,83,600 (c) 1,03,680 (d) 1,63,800	
Que 51. (MTP-24)	A room has 10 doors. In how many ways can a man enter the room by one door and come out by a different door. (a) 90 (b) 100 (c) 50 (d) None of these	
Que 52. (MTP-24)	In an election, there are five candidates contesting for three vacancies; an elector can vote any number of candidates not exceeding the number of vacancies. In how many ways can one cast his votes? (a) 12 (b) 14 (c) 25 (d) None of these	
Que 53. (MTP-24)	A box contains 7 red, 6 white and 4 blue balls. How many selections of three balls can be made so that none is red? (a) 90 (b) 120 (c) 48 (d) None of these	
Que 54. (MTP-24)	How many ways can 5 different trophies can be arranged on a shelf if one particular trophy must always be in the middle? (a) 24 (b) 120 (c) 48 (d) 144	

Que 55. (PYQ-15)	There are 6 men and 4 women in a group, then the number of ways in which a committee of 5 persons can be formed of them, if the committee is to include at least 2 women are: (a) 180 (b) 186 (c) 120 (d) 105	
Que 56. (PYQ-15)	In how many ways can a selection of 6 out of 4 teachers and 8 students be done so as to include at least two teachers? (a) 220 (b) 672 (c) 596 (d) 968	
Que 57. (PYQ-19)	If these are 40 guests in a party. If each guest takes a shake hand with all the remaining guests. Then the total number of hands shake is _____ (a) 780 (b) 840 (c) 1,560 (d) 1,600	
Que 58. (PYQ-20)	A fruity basket contains 7 apples, 6 bananas, and 4 mangoes. How many selections of 3 fruits can be made so that all 3 are apples? (a) 35 ways (b) 120 ways (c) 165 ways (d) 70 ways	
Que 59. (PYQ-20)	Out of 7 boys and 4 girls, a team of a debate club of 5 is to be chosen. The number of teams such that each team includes at least one girl is: (a) 439 (b) 429 (c) 419 (d) 441	
Que 60. (PYQ-21)	'n' locks and 'n' corresponding keys are available but the actual combination is not known. The maximum number of trials that are needed to assigns the keys to the corresponding locks is: (a) ${}^{(n-1)}C_2$ (b) ${}^{(n+1)}C_2$ (c) $\sum_{k=2}^{n}(k-1)$ (d) $\sum_{k=2}^{n} k$	

Que 61. (PYQ-25)	In how many ways can 5 Doctors 4 Professors, and 6 Auditors be seated in a row so that all person of the same profession sit together? (a) 3! × 5! (b) 3! × 5! × 4! (c) 3! × 5! ×4! x 6! (d) 3! × 5! × 6!	
Que 62. (PYQ-25)	In how many ways can an interview panel of 3 members be formed from 3 engineers, 2 psychologists and 3 managers if at least 1 engineer must be included? (a) 30 (b) 15 (c) 46 (d) 45	

Algebraic Based Problems

Que 63. (MTP-18)	$15C_{3r} = 15C_{r+3}$, then r is equal to (a) 2 (b) 3 (c) 4 (d) 5	
Que 64. (MTP-18)	${}^{n+2}C_n = 45$ find the value of n (a) 7 (b) 8 (c) 9 (d) 6	
Que 65. (MTP-19)	If ${}^nP_r = 336$ *and* ${}^nC_r = 56$, then n and r will be (a) (3, 2) (b) (8, 3) (c) (7, 4) (d) none of these	
Que 66. (MTP-23)	The value of N in $\frac{1}{7!} + \frac{1}{8!} = \frac{N}{9!}$ is (a) 81 (b) 78 (c) 89 (d) 64	
Que 67. (PYQ-18)	If ${}^{1000}C_{98} = {}^{999}C_{97} + {}^{x}C_{901}$, find x : (a) 999 (b) 998 (c) 997 (d) 1,000	

Space for Rough Work

Sequence & Series

Arithmetic Progression

Que 1. (MTP-18)	If 8^{th} term of an AP is 15, the Sum of the 15 its term is (a) 15 (b) 0 (c) 225 (d) 225/2	
Que 2. (MTP-18)	If $\frac{1+3+5+.....+n\ terms}{2+4+6+.....+50\ terms} = \frac{2}{51}$, then the value of 'n' (a) 9 (b) 10 (c) 12 (d) 13	
Que 3. (MTP-18)	If 6^{th} *and* 13^{th} term of an A.P are 15 and 36 respectively the A.P is (a) 2, 5, 8, 11 (b) 1, 4, 6, 8 (c) -4, -1, 2, 5 (d) 0, 3, 6, 9	
Que 4. (MTP-19)	The value of K, for which the terms 7K + 3, 4K – 5, 2K +10 are in A.P., is (a) 13 (b) -23 (c) 13 (d) 23	

Que 5. (MTP-19)	Which term of the AP 64,60,56,52…….. is zero (a) 16 (b) 17 (c) 15 (d) 14	
Que 6. (MTP-19)	The first term of an A.P is 100 and the sum of whose first 6 terms is 5 times the sum of the next 6 terms, then the c.d. is – (a) -10 (b) 10 (c) 5 (d) none of these	
Que 7. (MTP-20)	The first and the last term of an AP are -4 and 146. The sum of the terms is 7171. The number of terms is (a) 101 (b) 100 (c) 99 (d) none of these	
Que 8. (MTP-21)	The sum of the first 3 terms in an AP is 18 and that of the last 3 is 28. If the AP has 13 terms, what is the sum of the middle three terms? (a) 23 (b) 18 (c) 19 (d) none of the above	

Que 9. (MTP-22)	The first and fifth term of an A.P of 40 terms are -29 and -15 respectively. Find the sum of all positive terms of this A.P. (a) 1605 (b) 1705 (c) 1805 (d) None of these	
Que 10. (MTP-22)	Find the value of $1 + 2 + 3 + - - - - - +105$ (a) 5000 (b) 5560 (c) 5565 (d) None of these	
Que 11. (MTP-22)	The first and last terms of an arithmetic progression are 5 and 905. Sum of the terms is 45,955. The number of terms is (a) 99 (b) 100 (c) 101 (d) 102	
Que 12. (MTP-23)	The 4^{th} term of an A.P. is three times the first and the 7^{th} term exceeds the third term by 1. Find the first term 'a' and common difference 'd'. (a) a = 3, d=2 (b) a = 4, d=3 (c) a = 5, d=4 (d) a = 6, d=5	

Que 13. (MTP-24)	Divide 144 into three parts which are in AP and such that the largest is twice the smallest, the smallest of three numbers will be: (a) 48 (b) 36 (c) 13 (d) 32	
Que 14. (PYQ-24)	If the second and eight terms of an arithmetic progression (AP) are equal to constant σ, then the sum of first n terms of this AP is equal to: (a) nα (b) α/n (c) 2n + n(α-1) (d) n + α(n-1)	
Que 15. (PYQ-24)	The 3^{rd} term of arithmetic progression is 7 and Seventh term is 2 more than thrice of third term. The common difference is: (a) 4 (b) 3 (c) 5 (d) 6	

Arithmetic Mean

Que 16. (MTP-18)	The two-arithmetic means between 4 and 13 are (a) 7,10 (b) 3,14 (c) 5,12 (d) 6,11	
Que 17. (MTP-23)	If 20 AMs. are inserted between 3 and 51 then sum of these 20 A.M.s is (a) 540 (b) 1080 (c) 270 (d) None of these	

Geometric Progression

Que 18. (MTP-18)	For what values of x, the number $-\frac{2}{7}, x, -\frac{7}{2}$ are in G.P.? (a) ± 1 (b) ± 3 (c) ± 2 (d) none of these	
Que 19. (MTP-19)	Find the three numbers in G.P, whose sum is 19 and product is 216. (a) 9,6,4 or 4,6,9 (b) 9,6,3 or 3,6,9 (c) 9,3,1 or 1,3,9 (d) 9,3,-1 or -1,3,9	
Que 20. (MTP-19)	The sum of the first two terms of a GP is 5/3 and the sum of infinity of the series is 3. The common ratio is (a) 1/3 (b) 2/3 (c) -1/3 (d) none of these	
Que 21. (MTP-19)	The sum of the infinite series $1 + 2/3 + 4/9 + \ldots\ldots\ldots$ is (a) 1/3 (b) 3 (c) 2/3 (d) none of these	
Que 22. (MTP-22)	In a GP if fourth term is 3 then the product of first seven terms is (a) 3^5 (b) 3^7 (c) 3^6 (d) 3^8	

Que 23. (MTP-22)	In a G.P if the third term of a GP is $\frac{2}{3}$ and 6^{th} term is $\frac{2}{81}$, then the first term is (a) 6 (b) 1/3 (c) 9 (d) 2	
Que 24. (MTP-24)	The sum of the first eight terms of a G.P. is five times the sum of the first four terms; then the common ratio is – (a) $\sqrt{2}$ (b) $-\sqrt{2}$ (c) $\pm\sqrt{2}$ (d) None of these	
Que 25. (PYQ-19)	If $y = 1 + x + x^2 + \ldots\ldots\ldots\ldots \infty$ then $x =$ (a) $\frac{y-1}{y}$ (b) $\frac{y+1}{y}$ (c) $\frac{y}{y+1}$ (d) $\frac{y}{y-1}$	
Que 26. (PYQ-19)	Find the no. of terms of the series $25, 5, 1 \ldots\ldots\ldots\ldots \frac{1}{3125}$ (a) 6 (b) 7 (c) 8 (d) 9	

Que 27. (PYQ-21)	The largest value of n for which $\frac{1}{2}+\frac{1}{2^2}+....\frac{1}{2^n}<0.998$ is. (a) 9 (b) 6 (c) 7 (d) 8	
Que 28. (PYQ-25)	The product of three numbers which are in GP is 512. Then the second number is (a) 2 (b) 3 (c) 6 (d) 8	
Que 29. (PYQ-23)	Given an infinite geometric series with first term 'a' and common ratio 'r'. If its sum is 4 and the second term is $\frac{3}{4}$, then one of correct option is (a) $a=1\ and\ r=\frac{1}{4}$ (b) $a=3\ and\ r=\frac{3}{4}$ (c) $a=3\ and\ r=\frac{1}{4}$ (d) $a=1\ and\ r=\frac{1}{2}$	

Geometric Mean

Que 30. (MTP-23)	The mean proportional between $12x^2\ and\ 27y^2$ (a) 18xy (b) 81xy (c) 8xy (d) 9xy	

Relation Between AM, GM, HM

Que 31. (PYQ-19)	If AM and HM for two numbers are 5 and 3.2, respectively. GM will be: (a) 20 (b) 16 (c) 4 (d) 5	

Series is Given and Formula is Asked

Que 32. (MTP-19)	The n^{th} term of the sequence -1, 2, -4, 8,.. is (a) $(-1)^n 2^{n-1}$ (b) 2^{n-1} (c) 2^n (d) none of these	
Que 33. (MTP-21)	The sum of the series: $0.5 + 0.55 + 0.555 + \ldots\ldots$ to n term is: (a) $\frac{5n}{9} + \frac{5}{9}[1 - (0.1)^n]$ (b) $\frac{5n}{9} - \frac{5}{81}[1 - (0.1)^n]$ (c) $\frac{5n}{9} + \frac{5}{81}[1 - (0.1)^n]$ (d) $\frac{5n}{9} + \frac{5}{81}[1 + (0.1)^n]$	
Que 34. (MTP-21)	The sum of progression (a+b), a, (a-b) ..... n term is (a) $\frac{n}{2}[2a + (n-1)b]$ (b) $\frac{n}{2}[2a + (3-n)b]$ (c) $\frac{n}{2}[2a + (3-n)]$ (d) $\frac{n}{2}[2a + (n-1)]$	
Que 35. (MTP-24)	Find the sum of the series. $243 + 324 + 432 + \cdots \ldots \ldots \ldots \ldots \ldots \ldots$ to n terms (a) $3^6\left(\frac{4^n}{3^n} - 1\right)$ (b) $3^4\left(\frac{4^n}{3^n} - 1\right)$ (c) $3^6\left(\frac{3^n}{4} - 1\right)$ (d) None of these	
Que 36. (PYQ-15)	If the sum of 'n' terms of an Arithmetic Progression (A.P) is $3x^2 + 5x$ and its mth term is 164, then the value of m is: (a) 27 (b) 28 (c) 24 (d) 26	

Formula is Given and Sequence is asked

Que 37. (MTP-18)	The Sum of First n terms of an A.P is $5n^2 + 7n$. The 10^{th} term is (a) 101 (b) 96 (c) 84 (d) 102	
Que 38. (MTP-21)	If the sum of n terms of an A.P. is $(3n^2 - n)$ and its common difference is 6, then its third term is: (a) 10 (b) 12 (c) 14 (d) 16	
Que 39. (MTP-21)	Find the sum of first twenty-five terms of A.P. series whose n^{th} term is $\left(\frac{n}{5} + 2\right)$. (a) 105 (b) 115 (c) 125 (d) 135	
Que 40. (MTP-21)	If the sum of terms of an Arithmetic Progression is $2n^2$, the fifth term is (a) 20 (b) 50 (c) 18 (d) 25	

One Formula is Given & Another Formula is Asked

Que 41. (MTP-24)

If the sum of n terms of an A.P be $2n^2 + 5n$, then its 'n' term is:

(a) 4n – 2 (b) 3n – 4

(c) 4n + 3 (d) 3n + 4

Que 42. (MTP-24)

The n^{th} term of the series whose sum to n terms is $3n^2 + 2n$ is:

(a) 3n - 1 (b) 8n - 2

(c) 11n – 3 (d) 6n-1

Advanced Problems

Que 43. (MTP-20)

The sum of three numbers in G.P is 70. If the two extremes by multiplied each by 4 and the mean by 5, the products are in A.P. The numbers are

(a) 12, 18, 40 (b) 10, 20, 40

(c) 40, 20, 15 (d) none of these

Que 44. (MTP-20)

If a, b, c are in AP and x, y, z are in GP, then the value of $x^{(b-c)}.x^{(c-a)}.x^{(a-b)}$ is

(a) 1 (b) 0

(c) b (c – a) (d) none

Que 45. (MTP-21)

$\sum n^2$ defines:

(a) $\frac{n(n+1)(2n+1)}{6}$ (b) $\frac{n(n+1)}{2}$

(c) $\left[\frac{n(n+1)}{2}\right]^2$ (d) none of these

Que 46. (MTP-21)	The ratio of sum of first n natural numbers to that of sum of cubes of first n natural numbers is (a) 3: 16 (b) n(n+1)/2 (c) 2/n(n+1) (d) none of the above	
Que 47. (MTP-22)	If x, y and z are the terms in G.P, then the term $x^2+y^2, xy+yz, y^2+z^2$ are in (a) AP (b) GP (c) HP (d) none of the above	
Que 48. (MTP-22)	If the common difference of an AP equals to the first term, then the ratio of its m^{th} term and n^{th} term is: (a) n:m (b) m:n (c) $m^2: n^2$ (d) None of these	
Que 49. (MTP-22)	Sum lying from 100 to 300 which is divisible by 4 and 5 is (a) 2000 (b) 2100 (c) 2200 (d) 2300	
Que 50. (MTP-22)	Sum of x terms of two AP's are in the ratio $(3x+5):(5x+3)$ then ratio of their 10^{th} term is (a) 31:49 (b) 30:49 (c) 28:49 (d) none of these	

Que 51. (MTP-23)	In AP $T_p = q \; and \; T_q = p$ then T_{p+q} =------- (a) 0 (b) –(p+q) (c) $\frac{p+q}{2}$ (d) 1	
Que 52. (MTP-24)	If the p^{th} term of an A.P. is 'q' and the q^{th} term is 'p', then its r^{th} term is: (a) p + q + r (b) p + q – r (c) p – q – r (d) p + q	
Que 53. (PYQ-15)	if S be the sum, P the product and R is the sum of reciprocals of n- terms in G.P then P^2R^n = _____. (a) S^{2n} (b) S^n (c) S^{2n} (d) S^{-n}	

Measure of Central Tendency

Mean

Que 1. (MTP-18)	The mean of first 3 terms is 14 and the mean of next 2 terms is 18. The mean of 5 numbers is (a) 14.5 (b) 15 (c) 14 (d) 15.6	
Que 2. (MTP-18)	The mean of 1, 2, 3,…… n is $\frac{6x}{11}$; then the value of x is (a) 14 (b) 13 (c) 126 (d) 11	
Que 3. (MTP-19)	The mean of four observations is 10 and when a constant a is added to each observation, the mean becomes 13. The value of a is (a) 2 (b) -3 (c) 3 (d) none of these	
Que 4. (MTP-19)	The average salary of a group of unskilled workers is Rs.10,000 and that of a group of skilled workers is Rs.15,000. If the combined salary is Rs.12,000, then what is the percentage of skilled workers? (a) 40% (b) 50% (c) 60% (d) none of these	
Que 5. (MTP-19)	The average of n numbers is x. If each of the numbers is multiplied by (n + 1); then the average of new set of numbers is (a) x (b) $\frac{x}{n+1}$ (c) (n + 1).x (d) none of these	

Que 6. (MTP-19)	The average weight of 8 person increases by 1.5 kg, if a person weighing 65 kg replaced by a new person, what would be the weight of the new person? (a) 76 kg (b) 80 kg (c) 77 kg (d) none of these	
Que 7. (MTP-20)	Two variables assume the values 1, 2, 3, … 5 with frequencies as 1, 2, 3,…. 5, then what is the AM? (a) 11/3 (b) 15/8 (c) 4.86 (d) 10	
Que 8. (MTP-21)	The mean height of girls in class in 162 cm while for boys is 182 cm. The ratio of number of girls: boys is 1: 2. Find the mean height of the whole class (a) 170 cm (b) 180 cm (c) 154 cm (d) None of these	
Que 9.	The mean salary of a group of 50 persons is Rs.5850. Later on it is discovered that the salary of one has been wrongly taken as Rs.8000 instead of Rs.7800. The corrected mean salary is (a) Rs.5854 (b) Rs.5846 (c) Rs.5640 (d) none	

Que 10. (MTP-23)

The average of $(p+q)$ consecutive numbers starting from 1 is 'r'. If 's' is added to each of the numbers then the new average will be?

(a) r+s

(b) r+(s/2)

(c) $\{r + (p+q+s)\}/(p+q)$

(d) None of these

Que 11. (MTP-23)

The average wages of a group of unexperienced labours is Rs.1000 and that of a group of experienced labours is Rs.1,500. If the combined wage is Rs.1200, then what is the percentage of experienced labours?

(a) 60% (b) 40%

(c) 50% (d) None of these

Que 12. (PYQ-17)

A company's past 10 years average earning is Rs. 40 crores. To have the same average earning for 11 years including these 10 years, how much earning must be made by the company in the eleventh year?

(a) Rs. 40 crores

(b) Rs. $\frac{40\times10}{11}$ crores

(c) More than Rs. 40 crores

(d) None of the above

Que 13. (PYQ-17)

If the mean value of seven numbers 7, 9, 12, X, 4, 11 and 5 is 9, then the missing number X will be:

(a) 13 (b) 14

(c) 15 (d) 8

Que 14. (PYQ-18)

If the mean of the following distribution is 6 then the value of P is;

x	2	4	6	10	P+5
f	3	2	3	1	2

(a) 7 (b) 5

(c) 8 (d) 11

Que 15. (PYQ-23)

Find the mean of the following data

Class Interval	Frequency
10-20	9
20-30	13
30-40	6
40-50	4
50-60	6
60-70	2
70-80	3

(a) 23.7 (b) 35.7

(c) 39.7 (d) 43.7

Que 16. (PYQ-25)

The mean of three numbers is 135. Among the three numbers the biggest number is 180. The difference between the remaining two numbers is 25. Then the smallest number is

(a) 130 (b) 125

(c) 120 (d) 100

Que 17.

The students of a class X^{th} have an average weight of 50 kg. The strength of the class is 49 students. On including the weight of the principal, the average weight shoots up by 0.8 kg. Find the weight of the principal?

(a) 75 (b) 90

(c) 85 (d) None of these

Partition Value

Que 18. (MTP-21)

The median of the data 13, 8, 11, 6, 4, 15, 2, 18 is

(a) 5 (b) 8

(c) 11 (d) 9.5

Que 19. (MTP-21)

What is the value of the first quartile for observations 15,18,10,20,23,28,12,16?

(a) 17 (b) 16

(c) 12.75 (d) 12

Que 20. (MTP-21)

The median following numbers, which are given in ascending order is 25. Find the value of x 11,13,15,19, $(x+2)$, $(x+4)$,30,35,39,46

(a) 22 (b) 20

(c) 15 (d) 30

Que 21. (MTP-23)

If mean $(\overline{x})$ is $= 10$ and mode (Z) is $= 7$, then find out the value of median (M)

(a) 9 (b) 17

(c) 3 (d) 4.33

Que 22. (PYQ-18)

For 899, 999, 391, 384, 390, 480, 485, 760, 111, 240 Rank of median is

(a) 2.75 (b) 5.5

(c) 8.25 (d) none

Que 23. (PYQ-19)

For the distribution

X	1	2	3	4	5	6
F	6	9	10	14	12	8

The value of median is

(a) 3.5 (b) 3

(c) 4 (d) 5

Que 24. (PYQ-19)

Find the median of the following.

Class Interval	Frequency
0-10	2
10-20	3
20-30	4
30-40	5
40-50	6

(a) 35 (b) 32

(c) 36 (d) 37.5

Mode

Que 25. (PYQ-19)

Find the mode of the following data:

Class Interval	Frequency
3-6	2
6-9	5
9-12	10
12-15	23
15-18	21
18-21	12

(a) 25 (b) 4.6
(c) 14.6 (d) 13.5

Que 26. (PYQ-25)

If the mode of the following data is 13, then the value of x in the data set is
13, 8, 6, 3, 8, 13, 2x + 3, 8, 13, 3, 5, 7
(a) 6 (b) 5
(c) 7 (d) 8

Geometric Mean

Que 27. (MTP-21)

Find the two numbers if AM and GM is 10 and 6 respectively
(a) 6, 6 (b) 12, 8
(c) 9, 4 (d) 18, 2

Harmonic Mean

Que 28. (MTP-18)

A man travels from Delhi to Agra at an average speed of 30 km per hour and back at an average speed of 60 km per hour. What's the average Speed.
(a) 48 km/hr (b) 40 km/hr
(c) 45 km/hr (d) 35 km/hr

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If there are two groups with 75 and 65 as harmonic means containing 15 and 13 observations then combined HM is given by
(a) 70.36 (b) 72.25
(c) 78 (d) 76

Que 30. (PYQ-20)	The harmonic mean A and B is 1/3 and harmonic mean of C and D is 1/5. The harmonic mean of ABCD is (a) 8/15 (b) ¼ (c) 1/15 (d) 5/3	

Problem Based on Common Property

Que 31. (MTP-20)	If the relationship between two variables u and v are given by $2u + v + 7 = 0$ and if the AM of u is 10, then the AM of v is (a) 17 (b) -17 (c) -27 (d) 27	
Que 32. (PYQ-21)	If $y = 3 + (4.5)\,x$ and the mode for x- value is 20, then the mode for y- value is (a) 3.225 (b) 12 (c) 24.5 (d) 93	

Relation Between AM GM & HM

Que 33. (MTP-21)	If the A.M and H.M for two numbers are 5 and 3.2 respectively then the G.M. will be: (a) 4.05 (b) 16 (c) 4 (d) 4.10	
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Que 35. (MTP-22)	Median of distribution can be obtained from (a) Frequency polygon (b) Histogram (c) Ogives (d) None of these	
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Measure of Dispersion

Range

Que 1. (MTP-21)

What is the coefficient of range for the following distribution?

Class Interval	Frequency
10-19	11
20-29	25
30-39	16
40-49	7
50-59	3

(a) 22 (b) 50

(c) 75.82 (d) 72.46

Que 2. (PYQ-23)

If the range of a data is 20 and its smallest value is 5, then what is the largest value of data is?

(a) 20 (b) 25

(c) 5 (d) 30

Mean Deviation

Que 3. (MTP-18)

The MD about the Mean for the data 6, 9, 11, 10, 12, 12

(a) 1.47 (b) 1.57

(c) 1.67 (d) 1.87

Que 4. (MTP-18)

The coefficient of Mean deviation about mean for the first 9 natural numbers?

(a) 200/9 (b) 80

(c) 400/9 (d) 5

Que 5. (PYQ-21)

The probable value of mean deviation when $Q_3 = 40$ and $Q_1 = 15$ is:

(a) 15 (b) 18.75

(c) 17.50 (d) 0

Que 6. (PYQ-21)

The mean deviation of the numbers 3, 10, 6, 11, 14, 17, 9, 8, 12 about the mean is (correct to one decimal place):

(a) 8.7 (b) 4.2

(c) 3.1 (d) 9.8

Que 7. **(PYQ-21)**	If there are 3 observations 15, 20, 25 then the sum of deviation of the observations from their AM is (a) 0 (b) 5 (c) -5 (d) 10	

Quartile Deviation

Que 8. **(MTP-19)**	The quartiles of a variable are 45, 52 and 65 respectively. Its quartile deviation is (a) 10 (b) 20 (c) 25 (d) 8.30	
Que 9. **(PYQ-19)**	The Q.D of 6 numbers 15, 8, 36, 40, 38, 41 is equal to (a) 12.5 (b) 25 (c) 13.5 (d) 37	
Que 10. **(MTP-19)**	If the mean deviation of a normal variable is 16, what is its quartile deviation? (a) 10.00 (b) 13.50 (c) 15.00 (d) 12.05	
Que 11. **(MTP-18)**	If the SD of a variance X is σ then Quartile Deviation (QD) is (a) 4/5 σ (b) 3/2 σ (c) 2/3 σ (d) 5/4 σ	
Que 12. **(PYQ-19)**	Coefficient of quartile deviation is 1/4 then Q^3/Q^1 is (a) 5/3 (b) 4/3 (c) 3/4 (d) 3/5	
Que 13. **(PYQ-24)**	The quartile deviation of the distribution of the following data is: (a) 1 (b) 0 (c) ¼ (d) ½	

X	2	3	4	5	6
F(x)	2	4	8	4	1

Que 14. (PYQ-24)	If in data set, 25 percent of values are smaller than 30 and one-fourth of values are larger than 70, then the coefficient of quartile deviation is _____%. (a) 40 (b) 30 (c) 70 (d) 50	

Standard Deviation

Que 15. (MTP-18)	The SD for the data 6, 9, 10, 3, 7 is (a) 2.35 (b) 2.45 (c) 2.55 (d) 2.65	
Que 16. (MTP-18)	If the mean of frequency distribution is 100 and coefficient of variation is 45% then standard deviation is (a) 45 (b) 0.45 (c) 4.5 (d) 450	
Que 17. (MTP-18)	For two numbers "a" and "b", Standard Deviation given by (a) $\frac{\lvert a-b\rvert}{2}$ (b) $\sqrt{\frac{a-b}{2}}$ (c) $\frac{a+b}{2}$ (d) $\sqrt{\frac{a+b}{2}}$	
Que 18. (MTP-19)	If the values of all observations are equal then the Standard Deviation of the given observations is (a) 0 (b) 2 (c) 1 (d) none of these	
Que 19. (MTP-19)	Find the coefficient of variation if the sum of squared deviations taken from mean 40 of 10 observations is 360. (a) 15 (b) 20 (c) 40 (d) none of these	

Que 20. (MTP-20)	What is the coefficient of variation of the following numbers 53, 52, 61, 60, 64 (a) 18.09 (b) 8.09 (c) 12.23 (d) 15.45	
Que 21. (MTP-21)	If the variance of x = 148.6 and mean of x = 40, then the coefficient of variation is (a) 37.15 (b) 30.48 (c) 33.75 (d) none of these	
Que 22. (MTP-22)	SD of first consecutive natural numbers is: (a) $\sqrt{10}$ (b) $\sqrt{8}$ (c) $\sqrt{3}$ (d) $\sqrt{2}$	
Que 23. (MTP-22)	If the profit of a company remains same for the last 10 months, then the SD of profit of the company would be: (a) Positive (b) Negative (c) Zero (d) either (a) or (c)	
Que 24. (MTP-22)	If the standard deviation of 1,2,3,4,……. 10 is σ, then the standard deviation of 11,12,13,14……,20 is (a) 10σ (b) 10+σ (c) σ (d) none of these	

Que 25. (MTP-23)

There are two startups in ecommerce sector struggling to acquire the market. Following data is for Mean and Standard Deviation of billing amount of bought items per month on their website

Startup	A	B
No of customers Per month	40	30
Mean billing amount	Rs.2500	Rs.2200
SD of billing amount	Rs.10	Rs.11

Which startup has a better consistency when it comes to sales numbers?

(a) Startup A

(b) Startup B

(c) Both A and B

(d) Need more information

Que 26. (MTP-23)

If 5 is subtracted from each observation of some certain item then its co-efficient of variation is 10% and if 5 is added to each item then its coefficient of variation is 6%. Find original coefficient of variation.

(a) 8% (b) 7.5%

(c) 4% (d) None of these

Que 27. (MTP-23)

Mean and S.D. of a given set of observations' is 1,500 and 400 respectively. If there is an increment of 100 in the first year and each observation is hiked by 20% in 2nd years, then find new mean and S.D.

(a) 1920,480 (b) 1920,580

(c) 1600,480 (d) 1600,400

Que 28. (PYQ-19)

Standard deviation is _____ times of $\sqrt{MD \times QD}$

(a) 2/3 (b) 4/5

(c) $\sqrt{\frac{15}{8}}$ (d) $\sqrt{\frac{8}{15}}$

Que 29. **(PYQ-22)**	Find the standard deviation and coefficient of variation for. 1,9,8,5,7 (a) 2.828,49.32 (b) 2.828,48.13 (c) 2.828,47.13 (d) 2.828,50.13	
Que 30. **(PYQ-24)**	If each observation of a set is divided by 10, then the Standard Deviation of the new observation is: **(a)** $\frac{1^{th}}{100}$ of Standard Deviation of original observation. **(b)** $\frac{1^{th}}{10}$ of Standard Deviation of original observation. **(c)** 100 times of Standard Deviation of original observation. **(d)** 10 times of Standard Deviation of original observation.	
Que 31. **(PYQ-25)**	The standard deviation of the data 2, 4, 5, 6, 8, 17 is 23.33, then the standard deviation of the data 4, 8, 10, 12, 16, 34 is (a) 23.33 (b) 46.66 (c) 12.23 (d) 0	
Que 32. **(PYQ-19)**	If the profits of a company remain some for the last ten months, then the S.D. of profits of the company would be: (a) Positive (b) Negative (c) Zero (d) (a) or (c)	

Property Based Questions

Que 33. **(PYQ-23)**	If x and y are related as $4x + 3y + 11 = 0$ and mean deviation of y is 7.2 then mean deviation of x is? (a) 2.70 (b) 7.20 (c) 4.50 (d) 5.40	
Que 34. **(MTP-18)**	If x and y are related as $3x + 4y = 20$ and the quartile deviation of x in 12. Then the quartile deviation of y is: (a) 16 (b) 14 (c) 10 (d) 9	
Que 35. **(MTP-19)**	If x and y are related by 2x+3y+4=0 and SD of x is 6, then SD of y is (a) 22 (b) 4 (c) 40 (d) 9	
Que 36. **(MTP-19)**	If x and y are related by $y = 2x + 5$ and the SD and AM of x are known to be 5 and 10 respectively, then the coefficient of variation is (a) 25 (b) 30 (c) 40 (d) 20	
Que 37. **(MTP-19)**	The Standard Deviation of a set of 50 items is 10. Find the Standard Deviation if every item is increased by 5. (a) 15 (b) 5 (c) 10 (d) none of these	
Que 38. **(PYQ-17)**	If arithmetic mean and coefficient of variation of x are 10 and 40, respectively then the variance of $-15 + \frac{3x}{2}$ will be: (a) 64 (b) 81 (c) 49 (d) 36	

Correlation Analysis

Basic Problems

Que 1. (MTP-18)	Correlation Co-efficient is _____ of the units of measurements (a) Independent (b) Dependent (c) Both (d) none of these	
Que 2. (MTP-19)	Correlation analysis aims are (a) Predicting one variable for a given value of the other variable (b) Establishing relation between two variables (c) Measuring the extent of relation between two variables (d) Both (b) and (c)	
Que 3. (MTP-22)	The covariance between two variables is (a) Strictly positive (b) Strictly negative (c) Always 0 (d) Either positive or negative or zero	

Scatter Diagram

Que 4. (MTP-23)	A scatter diagram of two variables developing a pattern of multiple circular rings represents which kind of correlation? (a) Positive (b) Negative (c) Curvilinear (d) No correlation	
Que 5. (PYQ-17)	If there is a constant increase in a series, then the corresponding graph will be (a) Convex curve (b) Concave curve (c) Parabola (d) Straight line from the left to the right	
Que 6. (PYQ-18)	In case speed of an automobile and the distance required to stop the car after applying brakes correlation is (a) Positive (b) Negative (c) Zero (d) None	

Que 7. (PYQ-20)	Scatter diagram does not help us to? (a) Find the type of correlation (b) Identify whether variables correlated or not (c) Determine the linear or non-linear correlation (d) Find the numerical value of correlation coefficient	

Karl Pearson's Correlation Coefficient

Que 8. (MTP-24)	If for two variable x and y, the covariance, variance of x and variance of y are 40, 16 *and* 256 respectively, what is the value of the correlation coefficient? (a) 0.01 (b) 0.625 (c) 0.4 (d) 0.5	
Que 9. (MTP-21)	If the covariance between two variables is 20 and the variance of one of the variables is 16, what would be the variance of the other variable? (a) $S^2y \geq 25$ (b) More than 10 (c) Less than 10 (d) More than 1.25	
Que 10. (MTP-23)	If the coefficient of correlation between x and y is 0.5, the covariance is 16, and the standard deviation of xx is 4 then the Standard of y is (a) 4 (b) 8 (c) 16 (d) 64	
Que 11. (PYQ-19)	Given that **x**: -3, -3/2, 0, 3/2, 3 **y**: 9, 9/4, 0, 9/4, 9 Then Karl Pearson's coefficient of correlation is (a) Positive (b) Zero (c) Negative (d) None	

Que 12. (PYQ-21)	For the set of observations {(1,2), (2, 5), (3,7), (4,8), (5,10)} the value of Karl-person's coefficient of correlation is approximately given by (a) 0.755 (b) 0.655 (c) 0.525 (d) 0.985	
Que 13. (PYQ-24)	If $Cov(X,Y) = -2.15, S_x = 1.30, S_y = 2.50$ then correlation coefficient r is: (a) -0.66 (b) 0.66 (c) 0.76 (d) 0.99	

Spearman Rank Correlation

Que 14. (MTP-21)	If the sum of squares in difference of ranks, given by two judges A and B of 8 students is 21, what is the value of rank correlation coefficient (a) 0.7 (b) 0.65 (c) 0.75 (d) 0.8	
Que 15. (MTP-23)	The sum of the squares of differences in ranks of marks obtained in Physics and Chemistry by 10 students in a test is 150, then the coefficient of rank correlation by: (a) 0.849 (b) 0.091 (c) 0.909 (d) None of these	

Que 16. (MTP-24)	The coefficient of rank correlation of marks obtained by 10 students in English and Economics was found to be 0.5, it was later discovered that the difference in ranks in the two subjects obtained by one student was wrongly taken as 3 instead of 7. Find correct coefficient of rank correlation. (a) 0.514 (b) 0.364 (c) 0.15 (d) 0.260	

Coefficient Of Concurrent Deviation

Que 17. (PYQ-22)	If concurrent coefficient is $\frac{1}{\sqrt{3}}$. If sum of deviation is 6 for n pairs of data? (a) 9 (b) 8 (c) 10 (d) 11	

Property Based Problems

Que 18. (MTP-18)	If x and y are two correlated variables with correlation 0.60. If $u = 3x + 5$ and $V = 5y - 7$. The correlation coefficient of U and V is: (a) -0.60 (b) 0.60 (c) 1 (d) 0.36	
Que 19. (MTP-19)	If the coefficient of correlation between two variables is 0.7 then the percentage of variation unaccounted for is (a) 70% (b) 30% (c) 51% (d) 49%	

Que 20. (MTP-19)	If the coefficient of determination is 0.64 and the regression coefficient of x on y is 4 then the regression coefficient y on x is (a) 0.32 (b) 0.16 (c) 0.48 (d) 0.96	
Que 21. (MTP-22)	If correlation coefficient r between x and y is 0.5 then r between x and -y is (a) 1 (b) 0.5 (c) -0.5 (d) 0	
Que 22. (MTP-24)	The correlation between two variables x and y is found to be 0.4. What is the correlation between 2x and (–y)? (a) 0.4 (b) –0.4 (c) 0.6 (d) None of these	
Que 23. (PYQ-18)	The coefficient of determination is defined by the formula (a) $r^2 = \frac{1 - \text{unexplained variance}}{\text{total variance}}$ (b) $r^2 = \frac{\text{explained variance}}{\text{total variance}}$ (c) both (a) and (b) (d) none	
Que 24. (PYQ-19)	Find the probable error if $r = \frac{2}{\sqrt{10}}$ and $n = 36$ (a) 0.6745 (b) 0.067 (c) 0.5287 (d) None	
Que 25. (PYQ-25)	Standard Error (SE) and square root of sample size are (a) Directly proportional (b) Equal (c) Inversely proportional (d) Not equal	

Regression Analysis

Regression Coefficient (AIM -1)

Que 1. (MTP-23)	In a bivariate data $\sum X = 30$, $\sum Y = 40$, $\sum X^2 = 196, \sum XY = 850$ and N = 10. The regression coefficient of Y on X is: (a) -5.31 (b) -8.23 (c) 6.89 (d) None	
Que 2. (MTP-24)	If Y is dependent variable and X is independent variable and the S.D of X and Y are 5 and 8 respectively and Co-efficient of co-relation between X and Y is 0.8. Find the Regression co-efficient of Y on X. (a) 0.78 (b) 1.28 (c) 6.8 (d) 0.32	
Que 3. (MTP-19)	If the regression coefficient of y on x is 2.5, the correlation coefficient 0.6 and the SD is y of is 4, the SD of x is (a) 0.64 (b) 0.24 (c) 0.96 (d) 1.44	
Que 4. (MTP-22)	For a positive and perfectly correlated random variables, one of the regression coefficients is 1.4 and the standard deviation of X is 2, the variance of Y is (a) 2.37 (b) 6.76 (c) 6.56 (d) 3.16	
Que 5. (MTP-22)	If the regression line of Y on X is given by $Y - X + 2$ and Karl Pearson's coefficient of correlation is 0.5 then $\frac{\sigma_y^2}{\sigma_x^2}$ =_____. (a) 3 (b) 2 (c) 4 (d) none of these	

Regression Lines (AIM-2)

Que 6. (PYQ-25)	If r = 0.8, byx = 0.6, bxy = 0.5, .7 = 5 and $\bar{y} = 3$, then the regression equation y on x (a) y = 0.6x – 6.0 (b) y = 0.96x – 3.7 (c) y = 0.8x (d) y = 0.6x	
Que 7. (PYQ-23)	For variables X and Y for a set of four observation, $\sum X = 10, \sum Y = 14$, $\sum X^2 = 65$, $\sum Y^2 = 99$ and $\sum XY = 3$,then the regression line on Y on X is: (a) $Y = -0.8X - 5.5$ (b) $Y = 0.8X - 5.5$ (c) $Y = -0.8X + 5.5$ (d) $Y = 0.8X + 5.5$	
Que 8. (PYQ-18)	If the two lines of regression are $x + 2y - 5 = 0$ and 2x + 3y - 8 = 0, then the regression line of y on x is: (a) x + 2y - 5 = 0 (b) 2x + 3y - 8 = 0 (c) x + 2y = 0 (d) 2x + 3y = 0	

Estimating Value (AIM-3)		
Que 9. (PYQ-21)	If the slope of the regression line is calculated to be 5.5 and the intercept 15 then the value of Y and X is 6 is: (a) 88 (b) 48 (c) 18 (d) 78	
Property Based Problem		
Que 10. (MTP-18)	Equations of two lines of regression are $4x + 3y + 7 = 0$ and $3x + 4y + 8 = 0$, the mean of x and y are (a) 5/7 and 6/7 (b) -4/7 and -1/7 (c) 2 and 4 (d) none of these	
Que 11. (MTP-18)	If the two regression co-efficient are 4 and 16 the percentage of unexplained variation is: (a) 64 (b) 36 (c) 54 (d) 46	
Que 12. (MTP-21)	There are two equations: $m + 3p = 2$ and $6n + 2q = 1$. Correlation coefficients for p and q is 0.5. Find the correlation coefficients of m and n (a) 0.6 (b) 0.5 (c) -0.5 (d) none of these	

Correlation And Regression

Que 13. (MTP-18)	In a bivariate population, the linear regression lines $3x + y - 2 = 0$ *and* $y + x = 0$ then the coefficient of correlation is (a) 0 (b) 1/3 (c) -1/3 (d) $-1/\sqrt{3}$	
Que 14. (MTP-18)	Two lines of regression are given by $5x + 7y - 22 = 0$ and $6x + 2y - 22 = 0$. If the variance of y is 15, find the standard deviation of x? (a) $\sqrt{5}$ (b) $\sqrt{7}$ (c) $\sqrt{6}$ (d) $\sqrt{8}$	
Que 15. (MTP-19)	If the coefficient of determination is 0.64 and the regression coefficient of x on y is 4 then the regression coefficient of y on x is (a) 0.32 (b) 0.16 (c) 0.48 (d) 0.96	

Que 16. (MTP-21)	The regression equation x and y is $3x + 2y = 100$, the value of bxy (a) -2/3 (b) 100/3 (c) 3/2 (d) 2/3	
Que 17. (MTP-22)	If $4y - 5x = 15$ is the regression line of y on x and the coefficient of correlation between x and y is 0.75, what is the value of the regression coefficient of x on y? (a) 0.45 (b) 0.9375 (c) 0.6 (d) none of these	
Que 18. (MTP-23)	If $byx = 0.5, bxy = 0.45$ then the value of correlation coefficient is: (a) 0.23 (b) 0.25 (c) 0.39 (d) 0.47	
Que 19. (PYQ-18)	If the two regression lines are $3X = Y$ and $8Y = 6X$, then the value of correlation coefficient is (a) 0.5 (b) -0.5 (c) 0.75 (d) -0.80	
Que 20. (PYQ-23)	If the coefficient of correlation is 0.8 and regression coefficient $b_{xy} = 0.32$ then what is the value of regression coefficient b_{yx}? (a) 2 (b) 1 (c) 0.52 (d) 0.48	

Probability

Basic		
Que 1. (MTP-18)	A, B and C are three mutually exclusive & exhaustive events such that $P(A) = 2P(B) = 3P(C)$. What is P(B)? (a) 6/11 (b) 3/11 (c) 1/6 (d) 1/3	
Que 2. (MTP-22)	Let P be a probability function on $S = \{X_1, X_2, X_3\}$ if $P(X_1) = \frac{1}{4}$ and $P(X_3) = \frac{1}{3}$ then $P(X_2)$ is equal to: (a) 5/12 (b) 7/12 (c) ¾ (d) none of these	
Single Event		
Que 3. (MTP-18)	From a bag is containing 10 black and 20 white balls, a ball is drawn at random. What is the probability that is black? (a) ½ (b) 1/3 (c) 1 (d) 2	
Que 4. (MTP-19)	If a card is drawn at random from a pack of 52 cards, what is the chance of getting a Spade or an ace? (a) 4/13 (b) 5/13 (c) 0.25 (d) 0.20	
Que 5. (MTP-19)	Three balls are drawn at random from a bag containing 6 blue and 4 red balls. What is the chance that 2 balls are blue and 1 is red? (a) ¼ (b) ¾ (c) ½ (d) none of these	

Que 6. (MTP-19)	The probability that a person travels by a plane is $\frac{1}{5}$ and that he travels by train is $\frac{2}{3}$. Find the probability of his travelling neither by plane nor by train? (a) $\frac{13}{15}$ (b) $\frac{2}{15}$ (c) $\frac{1}{15}$ (d) none of these	
Que 7. (MTP-20)	Find the probability that a four-digit number comprising the digits 2, 5, 6 and 7 would be divisible by 4. (a) ¼ (b) 1/3 (c) ½ (d) 1	
Que 8. (MTP-20)	What is the probability of getting neither total of 7 nor 11 when the pair of dice is tossed? (a) 7/9 (b) 2/9 (c) 3/9 (d) 4/9	
Que 9. (MTP-22)	In a non-leap year, the probability of getting 53 Sundays or 53 Tuesdays or 53 Thursday is: (a) $\frac{4}{7}$ (b) $\frac{2}{7}$ (c) $\frac{3}{7}$ (d) $\frac{1}{7}$	
Que 10. (MTP-23)	Ticket numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn bears a number which is multiple of 3 or 7? (a) 1/5 (b) 2/5 (c) 3/5 (d) None of these	

Que 11. (MTP-23)	A class consists of 10 boys and 20 girls of which half the boys and half the girls have blue eyes. Find the probability that a student chosen random is a boy and has blue eyes. (a) 1/6 (b) 3/5 (c) 1/2 (d) None of these	
Que 12. (MTP-23)	If a number is selected at random from the first 50 natural numbers, what will be the probability that the selected number is a multiple of 3 and 4? (a) 5/50 (b) 2/25 (c) 3/50 (d) 4/25	
Que 13. (MTP-23)	If two dice are thrown then what is the probability that the sum of the faces of dice are square or cube number? (a) 1/4 (b) 1/2 (c) 1/3 (d) None of these	
Que 14. (MTP-24)	A bag contains 15 one-rupee coins, 25 two-rupee coins and 10 five-rupee coins. If a coin is selected at random from the bag, then the probability of not selecting a one-rupee coin is: (a) 0.30 (b) 0.70 (c) 0.25 (d) 0.20	
Que 15. (MTP-24)	In a box carrying one dozen of oranges, one third has become bad. If 3 oranges are taken out from the box at random, what is the probability that at least one orange out of the three oranges picked up is good? (a) $\frac{54}{55}$ (b) $\frac{1}{55}$ (c) $\frac{45}{50}$ (d) None of these	

Que 16. (PYQ-25)	In a class, there are 15 boys and 10 girls. Three students are selected at random. The probability that 1 girl and 2 boys are selected is (a) $\frac{21}{46}$ (b) $\frac{25}{17}$ (c) $\frac{1}{50}$ (d) $\frac{3}{25}$	
Que 17. (PYQ-25)	Two cards are drawn from a pack of 52 cards. The probability that one is a spade and one is a heart; is (a) $\frac{3}{20}$ (b) $\frac{29}{34}$ (c) $\frac{47}{100}$ (d) $\frac{13}{102}$	
Que 18. (PYQ-25)	A father had three sons namely, Kailash, Harish and Prakash. All are above 65 years in age. Prakash happens to be the eldest while Kailash as youngest. As per the health history, it is estimated that the probability that Kailash survives another 5 years is $\frac{4}{5}$, Harish survives another 5 years is $\frac{3}{5}$ and Prakash survives another 5 years is $\frac{1}{2}$. The probabilities that Kailash and Harish survive another 5 years is 0.46, Harish and Prakash survive another 5 years is 0.32 and Kailash and Prakash survive another 5 years is 0.48. the probability that all three sons survive another 5 years is 0.26. What shall be the probability that at least one of them survives another 5 years? (a) 0.78 (b) 0.72 (c) $\frac{7}{10}$ (d) $\frac{9}{10}$	

Que 19. (PYQ-25)	A problem is given to 5 students P, Q, R, S and T. If the probability of solving the problem individually is $\frac{1}{2}, \frac{1}{3}, \frac{2}{3}, \frac{1}{5}$ *and* $\frac{1}{6}$ respectively, then find the probability that the problem is solved. (a) 0.47 (b) 0.93 (c) 0.57 (d) 0.27	
Que 20. (MTP-20)	Rupesh is known to hit a target in 5 out of 9 shots whereas David is known to hit the same target in 6 out of 11 shots. What is the probability that the target would be hit once they both try? (a) 79/99 (b) 10/13 (c) 14/26 (d) 13/18	
Que 21. (MTP-21)	A problem in probability was given to three CA students A, B and C whose chances of solving it are 1/3, 1/5 and ½ respectively. What is the probability that the problem would be solved? (a) 4/15 (b) 7/8 (c) 8/15 (d) 11/15	
Que 22. (MTP-22)	A husband and a wife appear in an interview for two vacancies in the same post. The probability of husband's selection is 3/5 and that of wife's selection is 1/5. Then the probability that only one of them is selected is: (a) 16/25 (b) 17/25 (c) 14/25 (d) none of these	

Que 23. (MTP-22)	A candidate is selected for interview for 3 posts. For the first there are 3 candidates, for the second there are 4 and for the third there are 2. What are the chances of his getting at least one post? (a) ¾ (b) 2/3 (c) 1/10 (d) 1	
Que 24. (MTP-23)	A machine is made of two parts A and B. The manufacturing process of each part is such that probability of defective in part A is 0.08 and that B is 0.05. What is the probability that the assembled part will not have any defect? (a) 0.934 (b) 0.864 (c) 0.85 (d) 0.874	
Que 25. (MTP-23)	Probability of Ramesh & Deepak speaking truth is 1/4, 3/5. Find the probability of atmost one of them speaks truth. (a) 0.60 (b) 0.85 (c) 0.75 (d) None of these	

More Than One Event		
Que 26. (MTP-22)	A card is drawn from a pack of playing cards and then another card is drawn without the first being replaced. What is the probability of getting two kings: (a) 7/52 (b) 1/221 (c) 3/221 (d) none of these	
Que 27. (MTP-24)	A bag contains 8 red and 5 white balls. Two successive draws of 3 balls are made without replacement. The probability that the first draw will produce 3 white ball and second 3 red balls is: (a) 6/255 (b) 5/548 (c) 7/429 (d) 3/233	
Que 28. (MTP-24)	A box contains 5 white and 7 black balls. Two successive drawn of 3 balls are made (i) with replacement (ii) without replacement. The probability that the first draw would produce white balls and the second draw would produce black balls are respectively. (a) 6/321 and 3/926 (b) 1/20 and 1/30 (c) 35/144 and 35/108 (d) 7/968 and 5/264	

Total Probability		
Que 29. (MTP-21)	A bag contains 4 red and 5 Black balls. Another bag contains 5 Red and 3 Black balls. If one ball is drawn at random each bag. Then the probability that one Red and One Black is (a) 12/72 (b) 25/72 (c) 37/72 (d) 13/72	
Que 30. (MTP-22)	A bag contains 5 Red and Black balls. A ball is drawn at random from the bag and put into another bag contains 3 red and 7 black balls. A ball is drawn randomly from the second bag. What is the probability that it is red? (a) 32/99 (b) 1/3 (c) 74/99 (d) none of these	
Que 31. (MTP-22)	A speaks truth in 60% of the cases and B in 90% of the cases. In what percentage of cases are they likely on contradict each other in stating the same fact: (a) 36% (b) 42% (c) 54% (d) none of these	
Que 32. (MTP-24)	There are two boxes containing 5 white and 6 blue balls and 3 white and 7 blue balls respectively. If one of the boxes is selected at random and a ball is drawn from it, then the probability that the ball is blue is (a) 115/227 (b) 83/250 (c) 137/220 (d) 127/250	

Conditional Problems		
Que 33. (MTP-18)	Given that $P(A) = 1/2$ *and* $P(B) = 1/3$, $P(A \cap B) = 1/4$, what is P(A'/B') (a) ½ (b) 7/8 (c) 5/8 (d) 2/3	
Que 34. (MTP-20)	A pair of dice rolled. If the sum of the two dice is 9, find the probability that one of the dice showed is 3 (a) 1/3 (b) ¼ (c) ½ (d) 1/8	
Expected Value		
Que 35. (MTP-20)	In a business venture, a man can make a profit of Rs.50,000 or incur a loss of Rs.20,000. The probabilities of making profit or incurring loss, from the past experience, are known to be 0.75 and 0.25 respectively. What is his expected profit? (a) Rs.33,500 (b) Rs.34,500 (c) Rs.35,500 (d) Rs.32,500	
Que 36. (MTP-21)	A bag contains 6 white and 4 red balls. If a person draws 2 balls and receives Rs.10 and Rs.20 for a white and red balls respectively, then his expected amount is (a) Rs.25 (b) Rs.26 (c) Rs.29 (d) Rs.28	

Que 37. (MTP-22)

For a probability of a random variable x is given below:

X:	1	2	4	5	6
P:	0.15	0.25	0.2	0.3	0.1

What is the Standard deviation of x?

(a) 1.49 (b) 1.56

(c) 1.69 (d) 1.72

Odds In Faour/Against

Que 38. (MTP-18)

The odds in favor of an event is 2 : 3 and the odds against another event is 3 : 7. Find the probability that only one of the events occurs.

(a) $\frac{27}{50}$ (b) $\frac{17}{50}$

(c) $\frac{37}{50}$ (d) none of these