KRS

INSTRUCTIONS TO CANDIDATES

1. Please do not open this Booklet till you are said to do so.
2. **Duration of Test – 1 Hours**
3. Before commencement of the exam, please fill up necessary information in the space provided below and also in the answer sheet.
4. Use HB Pencil only to darken the circle for answer in the question.
5. For each correct answer, one mark will be awarded. For each wrong answer $^{1}/_{4}^{th}$ of the earmarked for each question will be deducted. If more than one circle is darkened for a question, it will be treated as wrong answer for questions not answered i.e., blanks, a zero will be given
6. Rough Work, if any must be done on the pages, specified as SPACE FOR ROUGH WORK only and nowhere else in the question paper booklet or in the answer sheet.

Marking the Answers
Example:
For Question No. 12, if the candidate Considers, the correct answer to be C, he is to mark as shown below
(Correct Method) 12 (A) (B) (●) (D)

Paper -1	
Topics *(Maximum Marks-50)*	
MATHEMATICS OF FINANCE & EQUATIONS	
To be Filled by Students	
Name of Candidate	
Roll No. **(Mobile No)**	
Question Paper Booklet Code	**KRS**

Signature of the

1. 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

2. Abdul has taken a loan from Bahadur at 7% p.a. The loan has to be repaid in three equal yearly instalments 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

3. 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 instalment plan?

(a) 18% (b) 19%

(c) 22% (d) 20%

4. 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

5. 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

6. 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

7. Rajesh deposits Rs.3,000 at the start of each quarter in his savings account. If the account earns interest 5.75% per annual compounded quarterly, how much money (in Rs) while 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

8. 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

9. 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

10. 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)

(a) leasing is not preferable (b) leasing is preferable

(c) cannot be determined (d) none of these

11. 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

12. 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

13. Certain sum of money borrowed at simple interest to ₹ 2688 in three years and to ₹ 2784 in four years at the rate per annum equal to

(a) 4% (b) 6%

(c) 5% (d) 7%

14. 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

15. A machine worth Rs. 4,90,740 is depreciated at 15% of its opening value each yearWhen would its value reduce by 90%?

(a) 11 years 6 months (b) 11 years 7 months

(c) 11 years 8 months (d) 14 years 2 months approximately

16. 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

17. A sum of money doubles itself in 4 years at certain compound interest rate. In how many years this sum will become 8 times at the same compound interest rate?

(a) 12 Years (b) 14 Years

(c) 16 Years (d) 18 Years

18. The difference between compound interest and simple interest on an amount of ₹ 15,000 for 2 years is ₹ 96. What is the rate of interest per Annum?

(a) 9% (b) 8%

(c) 11% (d) 10%

19. A company wants to replace its existing warm out machinery in 10 years the expected cost of machine would be 10 Lakh. If the management create a sinking fund. How much

provision needs to be made each year. Which can care at the rate of 10% compound annually. (Given $A(10,0.1) = 15.937425$

(a) ₹ 74,625 (b) ₹ 72,514

(c) ₹ 62,745 (d) ₹ 67,245

20. Jonny wants to have ₹ 2,00,000 in his saving account after three years. The rate of interest offered by bank is 8% per annum compounded annually. How much should he invest today to achieve his target amount?

(a) ₹ 1,47,489.10 (b) ₹ 1,58,766.44

(c) ₹ 1,71,035.59 (d) ₹ 1,84,417.96

21. The population of a town increases every year by 2% of the population of the beginning of the year. The approximate no. of years by which the total increase of population will be 40% is:

(a) 15 years (b) 17 years

(c) 19 years (d) 20 years

22. Govinda's mother decides to gift him ₹ 50,000 every year starting from today for the next 5 year. Govinda deposits this amount in a bank. As and when he receives and gets 10% per annum interest rate compounded annually. What is the present value of this annuity?

(a) ₹ 2,80,493.5 (b) ₹ 2,08,993.5

(c) ₹ 2,08,943.5 (d) ₹ 2,58,493.5

23. Manoj invests Rs. 12,000 at 6% per annum simple interest to obtain a total amount of Rs. 14,880. What is the time for which the amount was invested?

(a) 3 years (b) 4 years

(c) 2 years (d) 5 years

24. What is the effective rate of interest when principal amount of Rs. 50,000 deposited in a nationalized bank for one year, corresponding to a normal rate interest 8% per annum compounded quarterly

(a) 10.38% (b) 8.08%

(c) 8.16% (d) 8.24%

25. If the initial investment of 4,00,000 becomes Rs. 6,00,000 in 24 months, then the Compounded Annual Growth Rate (CAGR) is:

(a) 30.33% (b) 22.4%

(c) 19.46% (d) 14.47%

26. Compute the compound interest on Rs. 6,000 for $1\frac{1}{4}$ years at 8% per annum. Interest will be compounded quarterly

(a) 642 (b) 630.78

(c) 634.68 (d) 624.48

27. Kanta wants to accumulate Rs.4,91,300 in her savings account after three years. The rate of interest offered by bank is 6 ¼ % per annum compounded annually. How much amount should she invest today to achieve her target amount?

(a) Rs.4,37,500 (b) Rs.4,09,600

(c) Rs.46,900 (d) Rs.49,600

28. A loan of Rs.16,550 is to be paid in three equal annual instalments at compound interest. The value of annual instalment, if the rate of interest is 10% per annum is:

(a) Rs.1,243 (b) Rs.6,655

(c) Rs.6,565 (d) Rs.1,343

29. A certain amount at a rate of simple interest x, doubles in 5 years. At another rate of simple interest y, it becomes three times in 8 years. Then the difference between these two interest rates is

(a) 5% (b) 8%

(c) 3% (d) 4%

30. Anil deposited a certain amount in a bank at the rate of 10% per annum compounded semi—annually. At the end of one year Anil received a sum of ₹ 13,230. Then the sum deposited in the bank is.

(a) ₹ 13,000 (b) ₹ 1,200

(c) ₹ 12,000 (d) ₹ 5,000

31. The effective rate of interest corresponding to a nominal rate of 8% per annum payable quarterly is (Given that $(1.02)^4 = 1.08243216$)

(a) 6.24% (b) 5.38%

(c) 8.24% (d) 82.4%

32. Nominal Rate of Return =

(a)Real Rate of Return – Inflation (b)Real Rate of Return + Inflation

(c)Real Rate of Return / Inflation (d)Real Rate of Return × Inflation

33. If $2x - 3y = 1\ and\ 5x + 2y = 50$, then what is the value of (x – 2y)?

(a) -2 (b) 6

(c) 7 (d) 10

34. 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

35. The roots of the equation $x^2 + (2p - 1)x + p^2 = 0$ are real if

(a) $p \geq 1$ (b) $p \leq 4$

(c) $p \geq ¼$ (d) $p \leq ¼$

36. 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

37. 36. 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

38. 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

39. 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

40. 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) $-x^2 - 10x + 22 = 0$

41. 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.

42. 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

43. 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

44. 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

45. Of two numbers, $1/5^{th}$ of the greater is equal to $1/3^{rd}$ of the smaller and their sum is 16. The numbers are:

(a) (6, 10) (c) (12, 4)

(b) (9, 7) (d) (11, 5)

46. 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

47. 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

48. One root of the equation: $x^2 - 2(5 + m) + 3(7 + m) = 0$ is reciprocal of the other. Find the value of m.

(a)-20/3 (b)7

(c)1/7 (d)117

49. The value of $\sqrt{6 + \sqrt{6 + \sqrt{6+\ldots\ldots\ldots\infty}}}$ is

(a) -3 (b) 2

(c) 3 (d) 4

50. 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