KUMARAGURU
college of technology
character is life

Register Number: ……..

B.E/B.TECH DEGREE EXAMINATIONS: MAY 2018

(Regulation 2015)

Sixth Semester

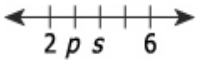
U15MAOE01/ P15MAOE01: MATHEMATICS FOR COMPETITIVE EXAMINATIONS

(Common to all Branches)

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions: (100 x 1=100 Marks)

1. The sum of the squares of three numbers is 138, while the sum of their products taken two at a time is 131. Their sum is:
   a) 20 b) 15
   c) 25 d) 30
2. What number should be subtracted from $x^3+4x^2-7x+12$, if it is to be perfectly divisible by x+3?
   a) 13 b) 39
   c) 42 d) 31
3. Three times the first of three consecutive odd integers is 3 more than twice the third. The third integer is:
   a) 9 b) 13
   c) 11 d) 15
4. The value of $\frac{(2.3)^3 - 0.027}{(2.3)^2 + 0.69 + 0.09}$ is
   a) 0 b) 2
   c) 1.6 d) 3.4
5. The remainder when 2^{89} is divided by 89 is
   a) 1 b) 88
   c) 87 d) 2
6. A two-digit number is such that the product of the digits is 8. When 18 is added to the number, then the digits are reversed. The number is:
   a) 18 b) 24
   c) 42 d) 81
7. A positive number which when increased by 17 is equal to 60 times the reciprocal of the number is
   a) 17 b) 10
   c) 15 d) 3
8. The value of $\sqrt{0.01}+\sqrt{0.81}+\sqrt{1.21}+\sqrt{0.0009}$ is
   a) 2.13 b) 2.1
   c) 2.11 d) 2.03
9. If $\frac{x}{y} = \frac{2}{3}$, then $\frac{x-y}{x} =$
   a) - 1/2 b) 5/2
   c) 1/2 d) 1/3

10. 

If m lies between the integers p and s on the number line shown, which of the following is a possible value for m ?

a) 2.9 b) 20/4
c) 10/3 d) √17

11. If 2994/14.5=172, then 29.94/1.45 is

a) 0.172 b) 1.72
c) 17.2 d) 172

12. Ram covers a part of the journey at 20 kmph and the balance at 70 kmph taking total of 8 hours to cover the distance of 400 km. How many hours has he been driving at 20 kmph?

a) 1 hours and 12 minutes b) 3 hours and 12 minutes
c) 2 hours and 36 minutes d) 5 hours and 50 minutes

13. The hundreds digit of the product 7777 x 9999 is

a) 2 b) 3
c) 4 d) 5

14. The last(units) digit of the number 333^{444} is

a) 1 b) 5
c) 3 d) 7

15. If the square roots of the natural numbers from 1 to 200 are calculated, the number of whole number will be

a) 10 b) 11
c) 12 d) 13

16. It was Sunday on Jan 1, 2006. What was the day of the week Jan 1, 2010?

a) Friday b) Sunday
c) Saturday d) Wednesday

17. If 6th March, 2005 is Monday, what was the day of the week on 6th March, 2004?

a) Saturday d) Wednesday
c) Sunday d) Tuesday

18. What is the angle between the two hands of a clock when the time shown by the clock is 6.30 p.m. ?

a) 150 b) 50
c) 30 d) 00

19. By how many degrees does the minute hand move in the same time, in which the hour hand moves by 280?

a) 196 b) 336
c) 168 d) 376

20. If the wheel of a bicycle makes 560 revolutions in travelling 1.1 km, what is its radius?

a) 31.25 b) 37.75
c) 11 d) 32.25

21. A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is:

a) 698 b) 650
c) 700 d) 648

22. The difference between simple and compound interests compounded annually on a certain sum of money for 2 years at 4% per annum is Re. 1. The sum (in Rs.) is:

a) 630 b) 620
c) 624 d) 625

23. In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit?

a) 30% b) 100%
c) 70% d) 250%

24. Sam purchased 20 dozens of toys at the rate of Rs. 375 per dozen. He sold each one of them at the rate of Rs. 33. What was his percentage profit?

a) 3.5 b) 6.5
c) 4.5 d) 5.6

25. In a mixture 60 liters, the ratio of milk and water 2 : 1. If this ratio is to be 1 : 2, then the quantity of water to be further added is:

a) 30 b) 40
c) 60 d) 50

26. A train can travel 50% faster than a car. Both start from point A at the same time and reach point B 75 kms away from A at the same time. On the way, however, the train lost about 12.5 minutes while stopping at the stations. The speed of the car is:

a) 100 kmph b) 120 kmph
c) 110 kmph d) 130 kmph

27. A man complete a journey in 10 hours. He travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.

a) 224 b) 220
c) 230 d) 234

28. A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?

a) 12 days b) 15 days
c) 10 days d) 18 days

29. If 6 men and 8 boys can do a piece of work in 10 days while 26 men and 48 boys can do the same in 2 days, the time taken by 15 men and 20 boys in doing the same type of work will be:

a) 4 days b) 5 days
c) 6 days d) 7 days

30. A can do a certain work in the same time in which B and C together can do it. If A and B together could do it in 10 days and C alone in 50 days, then B alone could do it in:

a) 30 days b) 15 days
c) 20 days d) 25 days

31. It is being given that $(2^{32} + 1)$ is completely divisible by a whole number. Which of the following numbers is completely divisible by this number?

a) $(2^{96} + 1)$ b) (7×2^{23})
c) $(2^{16} - 1)$ d) $(2^{16} + 1)$

32. How many of the following numbers are divisible by 132?
264, 396, 462, 792, 968, 2178, 5184, 6336

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

33. If the number 481 * 673 is completely divisible by 9, then the smallest whole number in place of * will be:

a) 2 d) 5

c) 6 d) 7

34. On dividing a number by 56, we get 29 as remainder. On dividing the same number by 8, what will be the remainder?

a) 4 b) 5

c) 6 d) 7

35 The least number which should be added to 2497 so that the sum is exactly divisible by 5, 6, 4 and 3 is:

a) 3 b) 13

c) 33 d) 23

36. Three number are in the ratio of 3 : 4 : 5 and their L.C.M. is 2400. Their H.C.F. is:

a) 40 b) 80

c) 120 d) 200

37. The product of two numbers is 4107. If the H.C.F. of these numbers is 37, then the greater number is:

a) 37 b) 111

c) 101 d) 107

38 Six bells commence tolling together and toll at intervals of 2, 4, 6, 8 10 and 12 seconds respectively. In 30 minutes, how many times do they toll together ?

a) 4 b) 10

c) 16 d) 15

39. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?

a) 360 b) 270

c) 720 d) 5020

40. Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?

a) 210 b) 25200

c) 120 d) 21400

41. How many 3-digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9, which are divisible by 5 and none of the digits is repeated?

a) 5 b) 10

c) 15 d) 20

42. In how many ways a committee, consisting of 5 men and 6 women can be formed from 8 men and 10 women?

a) 11760 b) 88600

c) 30000 d) 24000

Directions (43 -45):

1. Eleven students, A, B, C, D, E, F, G, H, I, J and K, are sitting in the first row of the class facing the teacher.
2. D who is to the immediate left of F is second to the right of C.
3. A is the second to the right of E, who is at one of the ends.
4. J is the immediate neighbor of A and B and third to the left of G.
5. H is to the immediate left of D and third to the right of I.

43. Who is sitting in the middle of the row ?

a) B b) C
c) I d) G

44. Which of the following group is sitting to the right of G ?

a) CHDE b) IBJA
c) ICHDF d) CHDF

45. If E and D, C and B, A and H and K and F interchange their positions, which of the following pairs of students is sitting at the ends?

a) D and E b) D and K
c) K and F d) D and A

46. If the roots of $x^2 - 5x + a = 0$ are equal, then a =

a) 25/5 b) 25
c) 25/4 d) 4

47. If one root of the equation $x^2 - 3x + a = 0$ is 2, then a=

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

48. The sum and the product of the roots of equation $x^2 - kx + k^2 = 0$ are

a) $-k, k^2$ b) $-k^2, k$
c) k, k^2 d) k^2, k

49. The roots of the equation $3x^2 - 12x + 10 = 0$?

a) Rational and unequal b) Complex
c) Real and equal d) Irrational and unequal

50. The sum and product of the roots of the quadratic equation $x^2 + 20x + 3 = 0$ are ?

a) 10,3 b) -10,3
c) -20,3 d) 20,-3

51. A boat having a length 3 m and breadth 2 m is floating on a lake. The boat sinks by 1 cm when a man gets on it. The mass of the man is

a) 12 b) 60
c) 72 d) 96

52. A rectangular field is to be fenced on three sides leaving a side of 20 feet uncovered. If the area of the field is 680 sq. feet, how many feet of fencing will be required?

a) 34 b) 40
c) 88 d) 68

53. An error 2% in excess is made while measuring the side of a square. The percentage of error in the calculated area of the square is

a) 2.02% b) 4%

c) 2% d) 4.04%

54. The diagonal of the floor of a rectangular closet is $7\frac{1}{2}$ feet. The shorter side of the closet is $4\frac{1}{2}$ feet. What is the area of the closet in square feet?

a) $5\frac{1}{4}$ b) $17\frac{1}{2}$

c) 27 d) 37

55. What is the least number of squares tiles required to pave the floor of a room 15 m 17 cm long and 9 m 2 cm broad?

a) 814 b) 844

c) 820 d) 824

56. The length of a rectangle is halved, while its breadth is tripled. What is the percentage change in area?

a) 20% increase b) 25% decrease

c) 50% increase d) 75% decrease

57. A rectangular field is to be fenced on three sides leaving a side of 20 feet uncovered. If the area of the field is 680 sq. feet, how many feet of fencing will be required?

a) 68 b) 40

c) 34 d) 88

58. A tank is 25 m long, 12 m wide and 6 m deep. The cost of plastering its walls and bottom at 75 paise per sq. m, is:

a) Rs.568 b) Rs.558

c) Rs.528 d) Rs.448

59. A man walked diagonally across a square lot. Approximately, what was the percent saved by not walking along the edges?

a) 33 b) 30

c) 40 d) 24

60. The ratio between the perimeter and the breadth of a rectangle is 5 : 1. If the area of the rectangle is 216 sq. cm, what is the length of the rectangle?

a) 18 cm b) 16 cm

c) 24 cm d) Data insufficient

61. In a shower, 5 cm of rain falls. The volume of water that falls on 1.5 hectares of ground is:

a) 75 cu. m b) 7500 cu. m

c) 750 cu. m d) 75000 cu. m

62. 66 cubic centimeters of silver is drawn into a wire 1 mm in diameter. The length of the wire in meters will be:

a) 90 b) 84

c) 192 d) 320

63. 50 men took a dip in a water tank 40 m long and 20 m broad on a religious day. If the average displacement of water by a man is 4 m^3, then the rise in the water level in the tank will be:

a) 20 cm
b) 35 cm
c) 25 cm
d) 50 cm

64. The slant height of a right circular cone is 10 m and its height is 8 m, the area of its curved surface.

a) 50π sq.m
b) 80π sq.m
c) 40π sq.m
d) 60π sq.m

65. A metallic sheet is of rectangular shape with dimensions 48 m x 36 m. From each of its corners, a square is cut off so as to make an open box. If the length of the square is 8 m, the volume of the box (in m^3) is:

a) 5120
b) 4520
c) 3420
d) 2520

66. The curved surface area of a cylindrical pillar is 264 m^2 and its volume is 924 m^3. Find the ratio of its diameter to its height.

a) 3:7
b) 4:7
c) 7:3
d) 5:2

67. What is the total surface area of a right circular cone of height 14 cm and base radius 7 cm?

a) 344.35 sq.cm
b) 492
c) 498.35 sq.cm
d) Data insufficient

68. A large cube is formed from the material obtained by melting three smaller cubes of 3, 4 and 5 cm side. What is the ratio of the total surface areas of the smaller cubes and the large cube?

a) 5:3
b) 3:2
c) 27:20
d) 25:18

69. A cistern of capacity 8000 litres measures externally 3.3 m by 2.6 m by 1.1 m and its walls are 5 cm thick. The thickness of the bottom is:

a) 90 cm
b) 1.9 dm
c) 1 dm
d) 1 m

70. A boat having a length 3 m and breadth 2 m is floating on a lake. The boat sinks by 1 cm when a man gets on it. The mass of the man is:

a) 60 kg
b) 72 kg
c) 87 kg
d) 56 kg

71. If TOUR is written in a certain code as 1234, CLEAR as 56784 and SPARE as 90847, what will be the 5th digit for SCULPTURE in the same code?

a) 3
b) 4
c) 6
d) 0

72. If in a certain language PROSE is coded as PPOQE, how is LIGHT coded in that code ?

a) LIGFT
b) LGGHT
c) LGGFT
d) LLGFE

73. If MIND becomes KGLB and ARGUE becomes YPESC, then what will DIAGRAM be in that code?

a) BGYEPYK
b) BGYPYEK
c) GLPEYKB
d) LKBGYPK

74. ELFA, GLHA, ILJA, _____, MLNA

a) OLPA b) KLMA

c) LLMA d) KLLA

75. Identify the figure that completes the pattern.

(X) (1) (2) (3) (4)

a) 1 b) 3

c) 2 d) 4

76. <u>Statements :</u> Some Poets are poems. No poem is song.

<u>Conclusions :</u>

I. Some Poems are not songs.

II. Some songs are poems.

a) Only I conclusion follows b) Only II conclusion follows

c) Either I or II follows d) Both I and II follows

77. <u>Statement :</u> Some hens are cows. All the cows are horses.

<u>Conclusion :</u>

I. Some horses are hens.

II. Some hens are horses.

a) Only I conclusion follows b) Only II conclusion follows

c) Either I or II follows d) Both I and II follows

78. <u>Statement :</u> All the poets are goats. Some goats are trees.

<u>Conclusion :</u>

I. Some poets are trees.

II. Some trees are goats.

a) Only I conclusion follows b) Only II conclusion follows

c) Either I or II follows d) Both I and II follows

79. <u>Statements :</u> All fans are lamps. Some lamps are birds.

<u>Conclusions :</u>

I. Some birds are fan.

II. All fan being birds is a possibility.

a) Only I conclusion follows b) Only II conclusion follows

c) Either I or II follows d) Both I and II follows

80. <u>Statements :</u> All the ties are shirts. Some pants are shirts.

<u>Conclusions :</u>

I. Some ties are pants.

II. No ties is a pants.

a) Only I conclusion follows b) Only II conclusion follows

c) Either I or II follows d) Both I and II follows

81. Introducing a man, a woman said, “He is the only son of my mother’s mother,” How is the woman related to that man?

a) Mother b) Niece

c) Cousin d) Aunt

82. Showing the lady in the park, Rajesh said, “She is the daughter of my grandfather’s only son”, How is Rajesh related to that lady?

a) Cousin b) Father

c) Brother d) Uncle

83. Introducing a girl Ram said, “Her mother is the only daughter of my mother-in-law”, How is Ram related to that girl?

a) Uncle b) Father

c) Husband d) Brother

84. **Statement:** Should India encourage exports, when most things are insufficient for internal use itself?

Arguments:

I Yes. We have to earn foreign exchange to pay for our imports.

II No. Even selective encouragement would lead to shortages.

a) Only argument I is strong b) Only argument II is strong

c) Either I or II is strong d) Both I and II are strong

85. **Statement:** Should there be students union in college/university?

Arguments:

I No. This will create a political atmosphere in the campus.

II Yes, it is very necessary Students are future political leaders.

a) Only argument I is strong b) Only argument II is strong

c) Either I or II is strong d) Both I and II are strong

86. Two dice are tossed, the probability that the total score is a prime number is

a) 1/6 b) 5/12

c) 1/2 d) 7/9

87. In a lottery, there are 10 prizes and 25 blanks. A lottery is drawn at random, the probability of getting a prize is

a) 1/10 b) 2/5

c) 2/7 d) 5/7

88. Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random, the probability that the drawn has a number which is a multiple of 3 or 5 is

a) 1/2 b) 2/5

c) 8/15 d) 9/20

89. The mean is

a) The statistical or arithmetic average b) The middlemost score

c) The most frequently occurring score d) The best representation for every set of data

90. Given the following data set, what is the value of the median? [2 4 3 6 1 8 9 2 5 7]

a) 2 b) 4.7

c) 4.5 d) 10

Directions (91 -95):

The following table gives the sales of batteries manufactured by a company over the years.

Number of Different Types of Batteries Sold by a Company Over the Years (Numbers in Thousands)

Year	Types of Batteries					
	4AH	7AH	32AH	35AH	55AH	Total
1992	75	144	114	102	108	543
1993	90	126	102	84	126	528
1994	96	114	75	105	135	525
1995	105	90	150	90	75	510
1996	90	75	135	75	90	465
1997	105	60	165	45	120	495
1998	115	85	160	100	145	605

91. The total sales of all the seven years is the maximum for which battery?

a) 4AH b) 7AH

c) 32AH d) 35AH

92. What was the approximate percentage increase in the sales of 55AH batteries in 1998 compared to that in 1992?

a) 28% b) 31%

c) 33% d) 34%

93. In case of which battery there was a continuous decrease in sales from 1992 to 1997?

a) 4AH b) 7AH

c) 32AH d) 35AH

94. The percentage of 4AH batteries sold to the total number of batteries sold was maximum in the year?

a) 1994 b) 1995

c) 1996 d) 1997

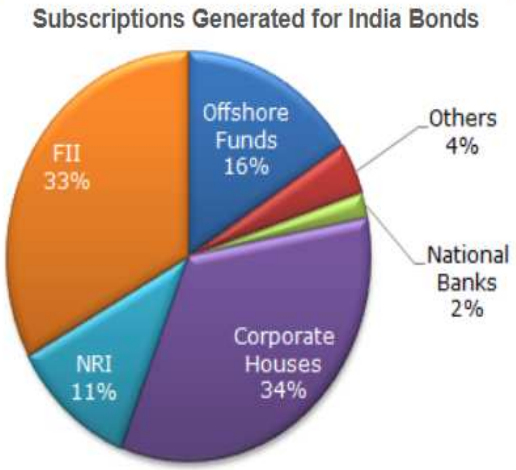
95. What is the difference in the number of 35AH batteries sold in 1993 and 1997?

a) 24000 b) 28000

c) 35000 d) 39000

Directions (96 -100):

The following pie chart shows the amount of subscriptions generated for India Bonds from different categories of investors.



96. In the corporate sector, approximately how many degrees should be there in the central angle?

a) 120 b) 121

c) 122 d) 123

97. What percentage of the total investment is coming from FII's and NRI's?

a) 33% b) 11%

c) 44% d) 22%

98. If the total investment other than by FII and corporate houses is Rs 335,000 crore, then

a) 274,100 b) 285,600

c) 293,000 d) Cannot be determined

99 If the investment by NRI's are Rs. 4,000 crore, then the investments by corporate houses and FII's together is:

a) 24,000 crore b) 24,363 crore

c) 25,423 crore d) 25,643 crore

100. If the total investment flows from FII's were to be doubled in the next year and the investment flows all other sources had remained constant at their existing levels for this year, then what would be the proportion of FII investment in the total investment into India bonds next year?

a) 40% b) 50%

c) 60% d) 70%

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