Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058

END SEM/~~RE-EXAM~~ EXAMINATION ~~DEC~~/JAN 2024-25

Program: M. Tech. Construction Management Sem I Duration: 3 hr

Course code: PC-MTCM-101 Maximum Points: 100

31/1/25

Name of the Course: Construction Organization and Safety Management

Semester: I

Instructions:

1. **Question no 1 is compulsory.**
2. **Attempt any 4 questions out of remaining 6 questions.**
3. **Neat diagrams must be drawn wherever necessary.**
4. **Figures to the right side indicate full points.**
5. **Assume Suitable data if necessary and state it clearly**

Q. No.	Questions	Points	CO	BL	Module
1a	Discuss the process of planning in the context of flyover construction project.	05	CO1	BL3	2
1b	Draw site organisation structure for the same.	04	CO1	BL2	2
1c	List the safety gears required on the site for flyover construction project.	03	CO2	BL2	5 &6
1d	Identify the hazards involved in the flyover construction project.	04	CO2	BL3	5
1e	Discuss the mitigation measures for the hazard identified.	04	CO2	BL3	5 &6
2a	Discuss contributions of Fredrick Taylor and Henry Fayol in management thought development with more emphasis on the improvement of construction productivity.	10	CO1	BL1	1
2b	Discuss the manpower planning in the context of construction project. Discuss the techniques and methods used for selection of manpower.	10	CO1	BL2	2
3a	Explain and discuss components of work study along with steps in work study. Discuss how it is useful for productivity improvement.	10	CO2	BL2	3
3b	Explain the job hazard analysis in the context of a) Excavation b) Layout c) RCC work	10	CO3	BL3	
4a	Discuss the different recording techniques in the context of method study	08	CO3	BL2	3
4b	Explain: McGregor's Theory 'X' and Theory 'Y' about the nature of people.	06	CO1	BL1	1
4c	State the duties and responsibilities of Safety officer.	06	CO3	BL2	4

5a	You have visited design and construction of 8.65 km long treated water tunnel project executed by AFCONS in the context of the same discuss the visitor's safety induction process.	08	CO3	BL2	5
5b	Explain in detail time and motion study in the brick masonry work. Draw process flow chart. Brief about how it is beneficial for productivity improvement.	08	CO2	BL2	3
5c	Differentiate production and productivity.	04	CO1	BL1	2&3
6a	Define site safety lapses and discuss the various solutions to overcome them.	07	CO2	BL2	5
6b	Discuss Role of Abraham Maslow in the context of the management.	05	CO1	BL1	1
6c	It is proposed to carryout underground drainage line in MCGM area, discuss the site specific safety plan.	08	CO3	BL1	5
7a	Discuss the occupational health safety & environmental policy of AFCONS in the context of design and construction of 8.65 km long treated water tunnel project.	08	CO3	BL2	7
7b	Discuss the typical contents of project health and safety plan.	08	CO3	BL2	5
7c	Difference between Training & Education in the context of manpower development.	04	CO1	BL1	2

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SET-I END SEM/~~RE~~-EXAM Examinations, January 2025

6/1/25

6/1/25

Total points:100

Duration: *Total Time allotted will be 3Hr.* M.Tech Civil with Const. mgt. Sem I

Class: M.TECH(CM) Semester: I Program: Civil

Name of the Course-Applied Statistics and Quantitative Techniques **Course** Code : PC- MTCM102

Instructions:

1. Assume suitable data if necessary and state the clearly.

Question No		Points	CO	BL	Module No
1 A	Survey and Survey ltd has two RMC plants, one located at Solan other at Mohan nagar. Each plants produces three products, M50, M60, M70 named as A, B, C. The number of concrete per day(in cubic meter) as follows Plant at / Solan (S) / Mohan nagar (M) M50(A) 1500 1500 M60(B) 3000 1000 M70(C) 2000 5000 A market survey indicates that during month of April three will be demand of 20,0000 m^3 of A , 40,0000 m^3 of B, 44,0000 m^3 of C. the operating cost per day for plants at Solan other at Mohan nagar are 600 thousands and 400 thousands. For how many days each plant be run in April as as to minimise production cost while still meeting market demand.	10	1,2	3	7
1 B	Solve By Big M Method Maximize Z = x1+2x2+3x3-x4 Subject to, x1+2x2+ 3x3 = 15 2x1 + x2+ 5x3 = 20 X1+ 2x2+x3+x4 = 10 X1, x2, x3,x4 >= 0.	10	1,3	3	7
Q 2A	The average number of collisions occurring in a two weeks during the summer months at a particular intersection is 4.	10	1,2	2	1

	a) What is the probability of no collisions in any particular week? b) What is the probability that there will be exactly one collision in a week? c) What is the probability of exactly two collisions in a week? d) What is the probability of finding not more than two collisions in a week? e) What is the probability of finding more than two collisions in a week? f) What is the probability of exactly two collisions in a particular two-week interval?				
Q2 B	Five employees are required to operate the chemical process, the process cannot be started until all 5 work stations are manned. Employees records indicate that there is 0.3 chance of any one employee being late, and we know that they all come to work independently of each other. Management is interested in knowing the probabilities of 0, 1,2,3,4 or 5 employees being late. So that decision concerning the number of backup personnel can be made.	10	1,3	3	1
Q 3 A	Eight coins were tossed 256 times and following results were obtained. No. of heads: 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 frequency: 2 | 6 | 30 | 52 | 67 | 56 | 32 | 10 | 1 Are coins biased? Use chi-square test.	10	1,2	3	4
Q 3 B	1) Explain central limit theorem. 2) What are, sampling and non-sampling errors?	10	2	2	3
Q 4 A	An advertising manager of one agency while advertising claimed that an attractive picture display on vending m/c will increase sales. In testing his claimed was found that 0n 40 days without display had a mean sale of 100 rs with std dev of 20 rs per day. The average sale for next 40 days when display was used was 110 rs per day with std dev 25 rs per day, as a client will you accept the claim of company?	10	2	2	3
Q 4 B	Certain pesticide is packed into bags by a machine. A random sample of 10 bags is drawn and their contents are found to be as follows:50,49,52,44,45,48,46,45,49,45. Test if the average packing to be taken 50 grams.	10	2	2	2
Q 5 A	A company manufactures around 200 mopeds. Depending upon the availability of raw materials and other condition, the daily production has been varying from 196 mopeds to 204 mopeds, whose probability distribution is given as follows Production/day: 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 Probability: 0.05 | 0.09 | 0.12 | 0.14 | 0.20 | 0.15 | 0.11 | 0.08 | 0.06 The finished mopeds are transported in specially designed three-storeyed lorry that can accommodate only 200 mopeds. Using the following 15 random numbers 82,89,78,24,53,61,18,45,04,23,50,77,27,54 and 10. Simulate the process to find out 1) What will be average number of mopeds waiting in the factory? 2) What will be number of empty spaces in the lorry?	10	2	3	5
Q 5 B	68 | 35 | 04 | 74 | 15 57 | 88 | 91 | 03 | 08	10	1,2	3	6

	91	60	75	45	60				
	52	53	24	07	82				
	51	18	82	13	07				
	Estimate Transportation cost by VAM method and check for optimality.								
Q 6 A	A travel agency's marketing brochure indicates that the standard deviations of hotel room rates for two cities are the same. A random sample of 13 hotel room rates in one city has a standard deviation of $27.50 and a random sample of 16 hotel room rates in the other city has a standard deviation of $29.75. Can you reject the agency's claim at $\alpha = 0.01$.								10	2	3	2
Q 6 B	Following data relate to average monthly price(X) and demand (Y) of a commodity during last ten months. Determine coeff of corelation.								10	2,3	3	4

Price	3.80	2.20	2.40	2.60	2.80	3.20	3	3.60	3.40	4
demand	3.6	6	5.8	5.8	5	4.8	4.8	4.2	4.8	3.2

Q 7 A	Three varieties of wheat w1,w2,w3 are treated with four different fertilizers . set up ANOVA				10	1,3	3	3

fertilizer	Wheat variety		
	W1	W2	W3
F1	55	72	47
F2	64	66	53
F3	58	57	74
F4	59	57	58

Q7 B	The number of defects in precast block is hypothesised to follow Poisson distribution. A random sample of 60 precast blocks showed the following data Does the hypothesis of Poisson Distribution see appropriate?	10	1,3	3	3

Number of Defects	00	01	02	03
Observed Frequency	32	15	9	4

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END SEM/~~RE~~-EXAM EXAMINATION JAN/~~FEB~~ 2025

Program: M.Tech Construction Management Sem I
Course Code: PE-MTCM112
Course Name: Advanced Construction Techniques

Duration: 3 Hrs.
Maximum Points: 100
Semester: I

10/11/25

Notes:

1. Attempt any 5 question out of 7 questions.
2. Answers to all sub questions should be grouped together.
3. Neat diagrams must be drawn wherever necessary.
4. Assume Suitable data if necessary and state it clearly.

Q.No.	Questions	Points	CO	BL	Module No.
1	a. Discuss effects and preventive measures of Landslide hazard.	8	CO1	BL2	1
	b. Explain in detail liquefaction of soil.	6	CO1	BL1	1
	c. Discuss challenges identified during construction of underground metro tunnel project.	6	CO1	BL2	2
2	a. Describe Tunnel drainage system in detail.	10	CO1	BL2	2
	b. Explain Earth Pressure Balance TBM.	10	CO1	BL2	2
3	a. Explain in detail various types of cofferdams.	10	CO1	BL2	3
	b. What is Sustainable construction? Discuss different industrial wastes that can be utilized for making Sustainable construction.	10	CO2	BL2	6

END SEM/~~RE~~-EXAM EXAMINATION JAN/~~FEB~~-2025

4	a. Discuss in detail different methods of drilled shaft.	10	CO1	BL2	3
	b. Write down in detailed procedure of pavement construction using bitumen. What precautions need to be taken while doing it?	10	CO1	BL2	5
5	a. Differentiate PEBs vs Conventional steel building.	10	CO2	BL4	6
	b. Explain low coast Road construction Techniques.	10	CO1	BL2	5
6	a. Discuss self-compacted concrete along with its application.	10	CO1	BL 4	4
	b. Elaborate different types of formwork used in construction industries with their advantages.	10	CO1	BL2	4
7	a. Explain 3D printing in construction with respect to i) Key aspects ii) Challenges and limitations iii) Future of 3D printing in construction	10	CO3	BL2	7
	b. Enlist the methods of soil stabilization and explain it along with need for soil stabilization.	10	CO1	BL2	1

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END SEM/RE-EXAM EXAMINATION JAN/FEB 2024-25 13/1/25

Program: Civil Engineering with specialization of Construction Management Sem I

Duration: 3 hr. **Course Code: MTCM PEC 122**

Maximum Points: 100 **Semester: I**

Course Name: Appraisal & Implementation of Infrastructure Projects

Notes:

1. **Q.1 is compulsory & attempt any four out of remaining six**
2. **Illustrate answer with neat sketches wherever required.**
3. **Make suitable assumptions where necessary and state them clearly.**

Q.No.	Questions	Points	BL	CO	Module No.
1.	**Attempt any Four** 1. Challenges faced by Urban Infrastructure in India. 2. Contents of Detailed Project Report. 3. Technical Appraisal 4. Make a list of success attributes/factors require in audit of Infrastructure projects. 5. Issues in Infrastructure finance planning.	20	L1	1-3	1-7
2	A. Define: Infrastructure. Explain any five government schemes sponsored to development of rural infrastructure in India. B. Discuss the various characteristics of infrastructure Projects.	12 +8	L1	1	1,2
3	A. Discuss the all phases of Infrastructure Projects in detail. B. Make a list of any 8 external stakeholders in infrastructure development. C. Write a short note on BOT Model.	12+4+4	L1	1,2	1,2
4	A. Define: Project Formulation. Discuss the objectives and elements of project formulations in detail. B. Define: Market Appraisal & uncertainties in market appraisal Forecast the demand of Tata Nexon cars for all subsequent years and 2022 in the table below by moving average method and weighted average moving method by assuming most relevant data is past subsequent years with factor 0.9,0.8,0.7,0.6. (also assume n=4)	12+8	L2/2	1,2	2,3

Year	Actual Value (St) in ('ooo)	Forecast Value (Ft) in ('ooo)
2011	30	-
2012	34	-
2013	33	-
2014	32	-
2015	35	-
2016	35	-
2017	38	-
2018	37	-
2019	37	-
2020	35	-
2021	41	-

5	A. What do you mean by Infrastructure Project Finance and SPV? Explain all types of finance available for Infrastructure Development in India. B. What is Planning Commission of India? Explain any four functions of planning commission in Infrastructure Development in India. C. What are the reasons for common projects failure?	10 +5+ 5	L1/ 2	2,3	5,6
6	A. What is accounting rate of return method? Discuss the limitations of ARR method. There are three projects X, Y & Z. The details of these projects are tabulated below. Compare and select best attractive one by using average or accounting rate of return method.	8+12	L3	2,3	4,5

Life of the project	Project A		Project B		Project C	
	4 years		5 years		6 years	
	PAT	BVI	PAT	BVI	PAT	BVI
I	4	15	3	12	2.5	10
II	4.5	13.50	4.5	10.80	3	9
III	5	12.15	5	9.72	4	8.1
IV	4.5	10.935	5.5	8.748	5	7.29
V	-	-	6	7.873	3	6.561
VI	-	-	-	-	2.5	5.905

PAT= Profit after Tax, BVI = Book value of investment, (numbers in lakhs)

	B. What is NITI Aayog? Discuss any five objectives of NITI Aayog. Also discuss any four sources of project finance.				
7	A. What do you mean by breakeven point analysis? A product currently sells for Rs 11 per unit. The variable costs are Rs 3 per unit, and 9,000 units are sold annually and a profit of Rs. 25,000 is realized per year. A new design will increase the variable costs by %20 and Fixed Costs by %20 but sales will increase to 13,000 units per year. (a) At what selling price do we break even, and (b) If the selling price is to be kept same (Rs 12/unit) what will the annual profit be? B.Discuss: NPV Vs IRR. 1) A project with a 4 year life and a cost of Rs. 235,000 generates revenue of Rs. 50,000 in year 1, Rs. 60,000 in year 2, Rs. 90, 000 in year 3 and Rs. 120,000 in year 4. If the discount rate is 15%, Can we accept the project? 2) Mr. Nitin is considering to invest Rs. 350,000 in a Hardware business. The cash inflows during the first, second and third years are expected to be Rs. 125,000, Rs. 150,000 and Rs, 170,000 respectively. Cost of capital is 12% Calculate the IRR for the proposed investment and interpret your answer.	10+10	L3	2,3	4

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15/1/25

End Semester Examination / ~~Re-Examination~~ Jan2025

RM DPR

Duration : 3 hours

Max marks 100

Instructions:

- Question 1 is compulsory
- Attempt any four questions out of remaining six
- Draw neat diagrams
- Assume suitable data if necessary
- Use of standard tables are permitted

MTech	MTech Civil-Structural Engineering	MTech Civil-Construction Management	MTech Electrical - Power Electronics and Power System	MTech Mech-Machine Design
Course Code	PC-MTSE103	PC-MTCM103	PC-MTPX103	PC-MTMD103

Question No		Max Points	CO	BL	Module
Q1A	State the Guidelines to write research article	10	CO2	5	M1 toM4
Q1B	State the guidelines to prepare and file the patent	10	CO4	5	M6, M7
Q2A	What do you mean by stratification? Explain the stratification with necessary example.	10	CO3	3	M4
Q2B	What is simple random sampling, and how is it conducted? What is systematic sampling, and when is it used? Illustrate stratified sampling with suitable example.	10	CO3	3	M3
Q3A	A multi-hospital system (MHS) owns 12 hospitals. Revenues (x, or the independent variable) and profits (y, or the dependent variable) for each hospital are given below. Obtain a regression line for the data, and predict profits for a hospital with $10 million in revenues. All figures are in millions of dollars.	10	CO2 CO3	5	M4

Multi Hospital System Revenues and Profits Data

Hospital	Revenue (x)	Profit (y)
1	7	0.15
2	2	0.10
3	6	0.13
4	4	0.15
5	14	0.25
6	15	0.27
7	16	0.24
8	12	0.20
9	14	0.27
10	20	0.44

	11 | 15 | 0.34 12 | 7 | 0.17					
Q3B	Write a short note on Trademark using the following points • Purpose and Example • Eligibility • Protection Duration • Registration • Use Cases and Penalties for infringement	10	CO4	3	M6, M7
Q4A	Explain the process of filing a copyright with necessary flow chart. Illustrate copyright concept with examples.	10	CO4	3	M6 M7
Q4B	What are the different types of Intellectual properties. Explain Geographical Indications based on purpose, example, duration	10	CO4	3	M6 M7
Q5A	The management of ABC company is considering the question of marketing a new product. The fixed cost required in the project is Rs.8,000. Three factors are uncertain viz. the selling price, variable cost and they annual sales volume. The product has a life of only one year. The management has the data on three factors as under: **Selling Price (Rs.) | Probability | Variable Cost (Rs.) | Probability | Sales Volume (Units) | Probability** 5 | 0.3 | 3 | 0.3 | 4,000 | 0.2 6 | 0.3 | 4 | 0.6 | 5,000 | 0.3 7 | 0.4 | 5 | 0.1 | 6,000 | 0.5 Considering the following sequence of thirty random numbers: 81, 32, 60, 04, 46, 31, 67, 25, 24, 10, 40, 02, 39, 68, 08, 59, 66, 90, 12, 64, 79, 31, 86, 68, 82, 89, 25, 11, 98, 16. Using the sequence (first 3 random numbers for the first trial etc.) simulate the average profit for the above project on the basis of 10 trails.	5	CO3	5	M4
Q5B	Write a short note on Sampling using the following • Definition and Purpose • Types of sampling • Key concepts and Factors influencing sampling • Advantages of sampling and Limitations of Sampling • Application	10	CO2 CO3	4	M4
Q6A	Explain Interview Techniques with examples	10	CO2	3	M3
Q6B	Refer the following the example. A population is divided into four strata so that N1 = 6500, N2 = 4500, N3 = 5500 and N4=7500 Respective standard deviations are: s1=10, s2=11, s3 = 9 and s4=7. How should a sample of size n = 96 be allocated to the three strata, if we want optimum allocation using disproportionate sampling design? If the cost for strata is 4400, 3800, 3500 and 4600 what can be cost disproportionate sampling design?	10	CO3	5	M3
Q7 A	A new product is launched by an organisation. The rating is given by its 33 existing customers of the South Region of the state as follows (1 being the lowest and 10 being the highest rating): 6, 10, 9,8,7,2,3,8,9,7,9,10,4,3,2,10,8,9,6,2,6,5,8,9,7,7,7,7,2,4,5,5,10. The marketers have an average rating from the whole state as 10.5. Now the organisation wants to know that the South Region also has the same rating or not. Use 5% level of significance.	12	CO3	5	M4
Q7 B	In a questionnaire there was a question - do you have an analogue watch? The options were in yes or no format. The data from a sample of 200 people shows that 130 people said yes and 70 people said no. The researcher wants to find out the customer based on analogue watches. Use 5% level of significance.	08	CO3	5	M4

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Annexure I: Z Table

Areas of a standard normal distribution

z	.0	0.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
.7	.2580	.2611	.2642	.2673	.2903	.2734	.2764	.2794	.2823	.2852
.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

Annexure II: Chi Square

Table 3: Critical Values of χ^2

Degrees of freedom	Probability under H_0 that of χ^2 > Chi square						
	.99	.95	.50	.10	.05	.02	.01
1	.000157	.00393	.455	2.706	3.841	5.412	6.635
2	.0201	.103	1.386	4.605	5.991	7.824	9.210
3	.115	.352	2.366	6.251	7.815	9.837	11.341
4	.297	.711	3.357	7.779	9.488	11.668	13.277
5	.554	.1145	4.351	9.236	11.070	13.388	15.086
6	.872	1.635	5.348	10.645	12.592	15.033	16.812
7	1.239	2.167	6.346	12.017	14.067	16.622	18.475
8	1.646	2.733	7.344	13.362	15.507	18.168	20.090
9	2.088	3.325	8.343	14.684	16.919	19.679	21.666
10	2.558	3.940	9.342	15.987	18.307	21.161	23.209
11	3.053	4.575	10.341	17.275	19.675	22.618	24.725
12	3.571	5.226	11.340	18.549	21.026	24.054	26.217
13	4.107	5.892	12.340	19.812	22.362	25.472	72.688
14	4.660	6.571	13.339	21.064	23.685	26.873	29.141
15	4.229	7.261	14.339	22.307	24.996	28.259	30.578
16	5.812	7.962	15.338	23.542	26.296	29.633	32.000
17	6.408	8.672	16.338	24.769	27.587	30.995	33.409
18	7.015	9.390	17.338	25.989	28.869	32.346	34.805
19	7.633	10.117	18.338	27.204	30.144	33.687	36.191
20	8.260	10.851	19.337	28.412	31.410	35.020	37.566
21	8.897	11.591	20.337	29.615	32.671	36.343	38.932
22	9.542	12.338	21.337	30.813	33.924	37.659	40.289
23	10.196	13.091	22.337	32.007	35.172	38.968	41.638
24	10.856	13.848	23.337	32.196	36.415	40.270	42.980
25	11.524	14.611	24.337	34.382	37.652	41.566	44.314
26	12.198	15.379	25.336	35.363	38.885	41.856	45.642
27	12.879	16.151	26.336	36.741	40.113	44.140	46.963
28	13.565	16.928	27.336	37.916	41.337	45.419	48.278
29	14.256	17.708	28.336	39.087	42.557	46.693	49.588
30	14.953	18.493	29.336	40.256	43.773	47.962	50.892