

COLLEGE OF ENGINEERING PUNE.

DEPARTMENT OF MATHEMATICS

END SEMESTER EXAMINATION

AS 09005 Mathematics & Statistics I for Planners

CLASS: F.Y.B.TECH(Planning) S.Y.B.Tech (Diploma)

Max. Marks: 60

TIME: 3 hrs 10.00 am To 1.00 pm

DATE / /2014

N.B. 1) Use of No-Programmable calculators are allowed.

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2) Attempt **Any Three** subparts from each Question.

3) All questions Carry Equal marks.

Q.1A Explain the different parts of Table in statistics. 5

B Find the standard deviation of the following 5

Age	20-25	25-30	30-35	35-40	40-45	45-50
Freq.	170	110	80	45	40	35

C The population of a country has increased from 84 million in 1998 to 108 million in 2008. Find the annual rate of growth of population. 5

D The first four central moments of distribution are 0, 2.5, 0.7, and 18.75, comment on skewness and kurtosis of distribution. 5

Q2 A The probability that a blub produced by a factory will fuse after 100days of use is 0.05. Find the probability that out of five such blubs (i) none (ii) not more than one (iii) more than one (iv) at least one will fuse after 100days of use. 5

B In a hurdle race a player has to cross 10 hurdles. The probability that he will clear each hurdle is $\frac{5}{6}$. What is the probability that he will knock down fewer than two hurdles? 5

C Determine Binomial distribution whose mean is 9 and whose standard deviation is $\frac{3}{2}$. 5

D An urn contain 9 red, 7 white and 4 black balls. A ball is drawn at random. What is the probability that the ball drawn will be (i) red? (ii) white? (iii) white/black (iv) red or black? 5

Q3 A A card is drawn at random from a well shuffled deck of 52 cards. Find the probability of (i) A king (ii) a heart (iii) A jack, Queen or a king (iv) a black card 5

B If the probability that an individual suffers a bed reaction from a certain injection is 0.001. Determine the probability that out of 2000 individuals (i) Exactly 3 (ii) more than 2, individuals will suffer a bed reaction. 5

C Write a short note on seasonal variations. 5

P.T.O.

- D If the variance of Poisson distribution is 2. Find the distribution, for $r = 1, 2, 3, 4$ and 5 5
using the formula for Poisson distribution.
- Q4 A Find the area under the standard normal curve which lies (i) between $Z = -0.90$ and $Z = -1.85$ (ii) between $Z = -0.90$ and $Z = -1.58$ 5
- B For a normal variate with mean 20 and variance 16, find (i) the probability that a value of x chosen at random lies between 12 and 24 (ii) the probability that the value chosen at random lies between 16 and 18. 5
- C The marks obtained by a large group of students in a final examination in statistics 5
have a mean of 58 and a standard deviation of 8.5. Assuming that these marks are approximately normally distributed what percentage of students can be expected to have obtained marks from 60 to 69, both inclusive?
- D An urn contains 7 red 4 blue balls. Two balls are drawn at random with replacement. 5
Find the probability of getting (i) 2 red balls, (ii) 2 blue balls (iii) one red and one blue balls.

Table A7
Normal Distribution

Values of the distribution function $\Phi(z)$ [see (3), Sec. 22 §]. $\Phi(-z) = 1 - \Phi(z)$

z	$\Phi(z)$	z	$\Phi(z)$	z	$\Phi(z)$	z	$\Phi(z)$	z	$\Phi(z)$	z	$\Phi(z)$
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.01	5040	0.51	6950	1.01	8438	1.51	9345	2.01	9778	2.51	9940
0.02	5080	0.52	6985	1.02	8461	1.52	9357	2.02	9783	2.52	9941
0.03	5120	0.53	7019	1.03	8485	1.53	9370	2.03	9788	2.53	9943
0.04	5160	0.54	7054	1.04	8508	1.54	9382	2.04	9793	2.54	9945
0.05	5199	0.55	7088	1.05	8531	1.55	9394	2.05	9798	2.55	9946
0.06	5239	0.56	7123	1.06	8554	1.56	9406	2.06	9803	2.56	9948
0.07	5279	0.57	7157	1.07	8577	1.57	9418	2.07	9808	2.57	9949
0.08	5319	0.58	7190	1.08	8599	1.58	9429	2.08	9812	2.58	9951
0.09	5359	0.59	7224	1.09	8621	1.59	9441	2.09	9817	2.59	9952
0.10	5398	0.60	7257	1.10	8643	1.60	9452	2.10	9821	2.60	9953
0.11	5438	0.61	7291	1.11	8665	1.61	9463	2.11	9826	2.61	9955
0.12	5478	0.62	7324	1.12	8686	1.62	9474	2.12	9830	2.62	9956
0.13	5517	0.63	7357	1.13	8708	1.63	9484	2.13	9834	2.63	9957
0.14	5557	0.64	7389	1.14	8729	1.64	9495	2.14	9838	2.64	9959
0.15	5596	0.65	7422	1.15	8749	1.65	9505	2.15	9842	2.65	9960
0.16	5636	0.66	7454	1.16	8770	1.66	9515	2.16	9846	2.66	9961
0.17	5675	0.67	7486	1.17	8790	1.67	9525	2.17	9850	2.67	9962
0.18	5714	0.68	7517	1.18	8810	1.68	9535	2.18	9854	2.68	9963
0.19	5753	0.69	7549	1.19	8830	1.69	9545	2.19	9857	2.69	9964
0.20	5793	0.70	7580	1.20	8849	1.70	9554	2.20	9861	2.70	9965
0.21	5832	0.71	7611	1.21	8869	1.71	9564	2.21	9864	2.71	9966
0.22	5871	0.72	7642	1.22	8888	1.72	9573	2.22	9868	2.72	9967
0.23	5910	0.73	7673	1.23	8907	1.73	9582	2.23	9871	2.73	9968
0.24	5948	0.74	7704	1.24	8925	1.74	9591	2.24	9875	2.74	9969
0.25	5987	0.75	7734	1.25	8944	1.75	9599	2.25	9878	2.75	9970
0.26	6026	0.76	7764	1.26	8962	1.76	9608	2.26	9881	2.76	9971
0.27	6064	0.77	7794	1.27	8980	1.77	9616	2.27	9884	2.77	9972
0.28	6103	0.78	7823	1.28	8997	1.78	9625	2.28	9887	2.78	9973
0.29	6141	0.79	7852	1.29	9015	1.79	9633	2.29	9890	2.79	9974
0.30	6179	0.80	7881	1.30	9032	1.80	9641	2.30	9893	2.80	9974
0.31	6217	0.81	7910	1.31	9049	1.81	9649	2.31	9896	2.81	9975
0.32	6255	0.82	7939	1.32	9066	1.82	9656	2.32	9898	2.82	9976
0.33	6293	0.83	7967	1.33	9082	1.83	9664	2.33	9901	2.83	9977
0.34	6331	0.84	7995	1.34	9099	1.84	9671	2.34	9904	2.84	9977
0.35	6368	0.85	8023	1.35	9115	1.85	9678	2.35	9906	2.85	9978
0.36	6406	0.86	8051	1.36	9131	1.86	9686	2.36	9909	2.86	9979
0.37	6443	0.87	8078	1.37	9147	1.87	9693	2.37	9911	2.87	9979
0.38	6480	0.88	8106	1.38	9162	1.88	9699	2.38	9913	2.88	9980
0.39	6517	0.89	8133	1.39	9177	1.89	9706	2.39	9916	2.89	9981
0.40	6554	0.90	8159	1.40	9192	1.90	9713	2.40	9918	2.90	9981
0.41	6591	0.91	8186	1.41	9207	1.91	9719	2.41	9920	2.91	9982
0.42	6628	0.92	8212	1.42	9222	1.92	9726	2.42	9922	2.92	9982
0.43	6664	0.93	8238	1.43	9236	1.93	9732	2.43	9925	2.93	9983
0.44	6700	0.94	8264	1.44	9251	1.94	9738	2.44	9927	2.94	9984
0.45	6736	0.95	8289	1.45	9265	1.95	9744	2.45	9929	2.95	9984
0.46	6772	0.96	8315	1.46	9279	1.96	9750	2.46	9931	2.96	9985
0.47	6808	0.97	8340	1.47	9292	1.97	9756	2.47	9932	2.97	9985
0.48	6844	0.98	8365	1.48	9306	1.98	9761	2.48	9934	2.98	9986
0.49	6879	0.99	8389	1.49	9319	1.99	9767	2.49	9936	2.99	9986
0.50	6915	1.00	8413	1.50	9332	2.00	9772	2.50	9938	3.00	9987