3/151

1701E1188

Candidate's Seat No : _____

IMBA in FM/HRPA/BM/BEM Sem.-7 Examination

BEM/HR/FM/MBA-102

QA

Time : 2-30 Hours] **January-2025** **[Max. Marks : 70**

Q.1 a) How can you tell if a hypothesis test should be one-tailed or two-tailed? (14)
b) What is measure of association? Explain the tools to quantify the relationship between variables with example

Q.2 There are 3 multiple choice questions in a MCQ test. Each MCQ consists of four possible choices and only one of them is correct. If an examinee answers those MCQ randomly (without knowing the correct answers) (14)
a. What is the probability that exactly any two of the answers will be correct?
b. What is the probability that at least two of the answers will be correct?
c. What is the probability that at most two of the answers will be correct?
d. What will be the average or expected number of correct answers?
e. Also, find the standard deviation of number of correct answers.

Or

Q.2 In a training programme (self-administered) to develop marketing skills of marketing personnel of a company, the participants indicate that the mean time on the programme is 500 hours and that this normally distributed random variable has a standard deviation of 100 hours. Find out the probability that a participant selected at random will take: (14)
i) fewer than 570 hours to complete the programme, and
ii) between 430 and 580 hours to complete the programme.

Q.3 Resting heart rate is known to be 71 beats per minute on average, with a standard deviation of 4 beats per minute. A set of researchers believe that heart rate will increase in men when they are waiting to go in to a job interview. To test this hypothesis, a group of 9 men attending job interviews are fitted with a wireless heart rate monitor to wear on their chest in the hour preceding their interviews. Their average heart rates over this hour are shown in the table below. (14)

Participant	Heart rate (bmp)
1	80
2	74
3	73
4	72
5	78
6	75
7	70
8	74
9	69

a) Should a z-test or a t test be used to check if there is significant evidence to suggest heart rate increases in men while they are waiting to attend a job interview?
b) Conduct the test at the 5% level and interpret your result
(Z test tabulated value = 1.645 and T test tabulated value =1.860)

Or

(P.T.O)

Q.3 A researcher reads a paper introducing a new test of executive function. The authors of the paper had tested 30 healthy volunteers and found that on average they score 51 on the new test. The researcher believes that patients with schizophrenia will score less than the normal average on this test of executive function. They test 22 patients with schizophrenia. The average score for the patients is 39 with a standard deviation of 4.3. Is there significant evidence at the 5 % level to support the researcher's claim? (tabulated value =1.721) (14)

Q.4 Three types of fertilizers are used on three groups of plants for 5 weeks. We want to check if there is a difference in the mean growth of each group. Using the data given below apply a one-way ANOVA test at 0.05 significant level. (14)

Fertilizer 1	Fertilizer 2	Fertilizer 3
6	8	13
8	12	9
4	9	11
5	11	8
3	6	7
4	8	12

$F_{(0.05)} = 3.68$

Or

Q.4 An automobile manufacturer is considering whether a new car model development project should consider only a gas model, only a hybrid model or both a gas or hybrid models. The manufacturer knows that his returns will vary depending on the future price of gas (increase, decrease, fluctuate) (14)

Gas prices	Probability	Profit (Rs.)		
		Gasoline	Hybrid	Both
Increase	0.5	1200	1500	650
Decrease	0.3	600	300	650
Fluctuate	0.2	300	-200	650

Using expected monetary values, which development choice should be chosen? Show it through decision tree.

Q.5 From the following payoff profit table, decide the best alternative using: (14)

Actions/ Strategies	Events/ States of Nature			
	E1	E2	E3	E4
A1	8	0	-10	6
A2	-4	12	18	-2
A3	14	6	0	8

a) Laplace Rule
b) Hurwicz Rule ($\alpha = 0.6$)
c) Minimax Regret Rule
d) Maxi-min Rule

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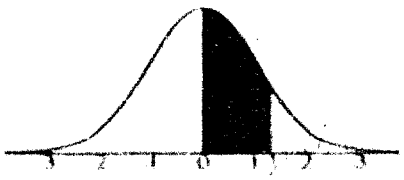

STANDARD NORMAL TABLE (Z)

Entries in the table give the area under the curve between the mean and z standard deviations above the mean. For example, for $z = 1.25$ the area under the curve between the mean (0) and z is 0.3944.

	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2969	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3513	0.3554	0.3577	0.3529	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998