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Candidate's Seat No : _____

IM.B.A. (PHM) (Rep) Sem.-4 Examination

PHM-BBA - CC-4

FoS-II

November-2025

Time : 2-30 Hours]

[Max. Marks : 70

- Instructions :** (1) This paper contains FIVE questions.
(2) All questions are compulsory.
(3) Question No.2, 3, 4 have internal options.
(4) Figures in the right side in parenthesis indicate marks.

Q:1 (A) It is known that on an average a person spends 61 minutes in a painting exhibition. If this time is normally distributed and 20% of the persons spent less than 30 minutes in the exhibition then find the variance of the distribution. Also determine the probability that a person spends more than 90 minutes in the exhibition. (07)

(B) In a sample of 40 parts manufactured by a company the number of defective parts was found to be 30. The company however claimed that only 5% of the products is defective. Test at 5% level of significance whether the company's claim is tenable (07)

Q:2 (A) Explain standard error in detail. (07)

(B) According to the U.S. Department of Labor, the average American household spends \$639 on household supplies per year. Suppose annual expenditures on household supplies per household are uniformly distributed between the values of \$253 and \$1,025. What are the standard deviation and the height of this distribution? What proportion of households spend more than \$850 per year on household supplies? What proportion of households spend more than \$1,200 per year on household supplies? What proportion of households spend between \$350 and \$480 on household supplies? (07)

OR

Q:2 (A) Define exponential distribution. State its properties. (07)

(B) A random sample of 100 articles selected from a batch of 2000 articles shows that the average diameter of the articles is 0.356 with a S.D 0.048. Find 95% confidence interval for the average of this batch of 2000 articles (07)

Q:3 Explain level of significance and Critical region. (14)

OR

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- Q:3 (A) Explain the procedure of decision making (07)
 (B) Explain one tailed test and two tailed test. (07)

Q:4 A manufacturer claimed that at least 95% of the equipments which he supplied to a factory confirmed to specifications. An examination of a sample of 200 pieces of equipments revealed that 18 were faulty. Test its claim at a significance level of (i) 5% (ii) 1% (14)

OR

Q:4 Ten students are selected at random from a college and their heights as found to be 100, 104, 108, 110, 118, 120, 122, 124, 126 and 125 cms. In the light of these data, discuss the suggestion that the mean height of the students of the college is 110 cms. (14)

Q:5 Do as directed: (14)

- i. Define Type-II Error.
- ii. What is the criteria for the rejection of the null hypothesis?
- iii. For a normal distribution, the estimated value of quartile deviation is 12. Find the value of standard distribution.
- iv. State the variance of uniform distribution.
- v. State the meaning of large sample and small sample.
- vi. What is the value of Z at 10% level of significance?
- vii. Define sample.

EXPONENTIAL FUNCTIONS
 Values of $e^{-\lambda}$
 $0 < \lambda < 1$

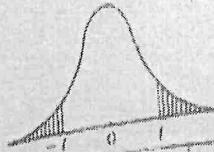
λ	0	1	2	3	4	5	6	7	8	9
0.0	1.0000	.9900	.9802	.9704	.9608	.9512	.9418	.9324	.9231	.9139
0.1	.9048	.8958	.8869	.8781	.8694	.8607	.8521	.8437	.8353	.8270
0.2	.8187	.8106	.8025	.7945	.7866	.7788	.7711	.7634	.7558	.7483
0.3	.7408	.7334	.7261	.7189	.7118	.7047	.6977	.6907	.6839	.6771
0.4	.6703	.6636	.6570	.6505	.6440	.6376	.6313	.6250	.6188	.6126
0.5	.6065	.6005	.5945	.5886	.5827	.5770	.5712	.5655	.5599	.5543
0.6	.5488	.5434	.5379	.5326	.5273	.5220	.5169	.5117	.5066	.5016
0.7	.4966	.4916	.4868	.4819	.4771	.4724	.4677	.4630	.4584	.4538
0.8	.4493	.4449	.4404	.4360	.4317	.4274	.4232	.4190	.4148	.4107
0.9	.4066	.4025	.3985	.3946	.3906	.3867	.3829	.3791	.3753	.3716

($\lambda = 1, 2, 3, \dots, 10$)

λ	1	2	3	4	5	6	7	8	9	10
$e^{-\lambda}$.36788	.13534	.04979	.01832	(0.00674)	(0.00248)	(.00091)	.00034	.000123	.000045

Table 9

TABLE OF 1



$$P = 2 \int_0^{\infty} \frac{\Gamma(\frac{n+1}{2}) dx}{\sqrt{\pi} \Gamma(\frac{n}{2} + \frac{x^2}{2})^{\frac{n+1}{2}}}$$

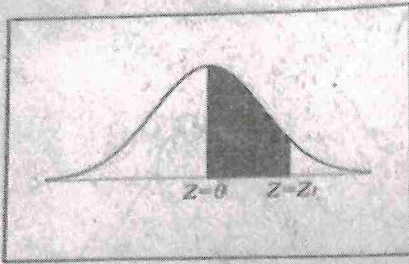
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	P-3	5	7	6	5	4	3	2	1	05	02	01
1	158	325	510	727	1000	1378	1903	3078	5314	12706	31821	63057
2	142	289	445	617	816	1061	1386	1886	2920	4303	6365	9321
3	137	277	424	584	765	978	1250	1638	2353	3182	4541	6241
4	134	271	414	569	741	941	1190	1533	2132	2776	3747	4804
5	132	267	408	559	727	920	1156	1476	2015	2571	3365	4332
6	131	265	404	553	718	906	1134	1440	1943	2447	3143	3707
7	130	263	402	549	711	896	1119	1415	1895	2365	2998	3499
8	130	262	399	546	706	889	1108	1397	1860	2308	2898	3365
9	129	261	398	543	703	883	1100	1383	1833	2262	2821	3250
10	129	260	397	542	700	879	1093	1372	1812	2228	2764	3169
11	129	260	396	540	697	876	1088	1363	1796	2201	2718	3106
12	128	259	396	539	695	873	1083	1358	1782	2179	2681	3055
13	128	259	394	538	694	870	1079	1350	1771	2160	2650	3012
14	128	258	393	537	692	868	1076	1345	1761	2145	2624	2977
15	128	258	393	536	691	866	1074	1341	1753	2131	2602	2947
16	128	258	392	535	690	865	1071	1337	1746	2120	2583	2921
17	128	257	392	534	689	863	1069	1333	1740	2110	2567	2898
18	127	257	392	534	688	862	1067	1330	1734	2101	2552	2878
19	127	257	391	533	688	861	1066	1328	1729	2093	2539	2861
20	127	257	391	533	687	860	1064	1325	1726	2086	2528	2845
21	127	257	391	532	686	859	1063	1323	1721	2080	2518	2831
22	127	256	390	532	686	858	1061	1321	1717	2074	2508	2819
23	127	256	390	532	685	858	1060	1319	1714	2069	2500	2807
24	127	256	390	531	685	857	1059	1318	1711	2064	2492	2797
25	127	256	390	531	684	856	1058	1316	1708	2060	2485	2787
26	127	256	390	531	684	856	1058	1315	1706	2056	2479	2779
27	127	256	389	531	684	855	1057	1314	1703	2052	2473	2771
28	127	256	389	530	683	855	1056	1313	1701	2048	2467	2763
29	127	256	389	530	683	854	1055	1311	1699	2045	2462	2756
30	127	256	389	530	683	854	1055	1310	1697	2042	2457	2750
31	12566	25335	38732	52449	67449	84162	103643	128765	164486	206996	252634	303283

P.T.O

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Table of Standard Normal Curve



Area Under the Standard Normal Curve

$Z = 0$ to $Z = Z_i$, z being standard normal variate

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2518	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.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	.4762	.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
3.1	.4990	.4991	.4991	.4991	.4992	.4992	.4992	.4992	.4993	.4993
3.2	.4993	.4993	.4994	.4994	.4994	.4994	.4994	.4995	.4995	.4995
3.3	.4995	.4995	.4995	.4996	.4996	.4996	.4996	.4996	.4996	.4997
3.4	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4998
3.5	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998