

**Department of Management**  
**School of Management and Business Studies**  
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**MBA -Semester I**  
**Odd Semester Examination - December 2025**

Subject Name: Quantitative Methods

Max. Marks: 60

Subject Code: MBA – FG – 108

Time: 2.5 Hours

**Attempt any Five Questions. All questions carry equal marks.**  
**Use of Scientific Calculator is allowed.**

(12 x 5 = 60)

Q1: Two fair dice are rolled simultaneously. Determine the probability in each of the following cases:

- a. Getting Even Numbers on both the dice
- b. Getting Prime Numbers on both the dice
- c. Getting multiples of 3 on both the dice or sum less than 10
- d. Getting doubles and odd numbers on both the dice

Q2: According to a study several years ago by the Personal Communications Industry Association, the average wireless phone user earns \$62,600 per year. Suppose a researcher believes that the average annual earnings of a wireless phone user are lower now, and he sets up a study in an attempt to prove his theory. He randomly samples 38 wireless phone users and finds out that the average annual salary for this sample is \$58,974, with a population standard deviation of \$7810. Use  $\alpha = .05$  to test the researcher's theory. Assume wages in this industry are normally distributed. (Use  $Z_{\frac{0.05}{2}} = \pm 1.96$ ,  $Z_{0.05} = 1.645$ )

Q3: The following arrangement of men, M, and women, W, lined up to purchase tickets for a rock concert:

MWMMWMMMWMWMMMWWMMMWWMMWMMMWWMMWMMMWWMMW  
 MMMMWWMM

Test for randomness at the  $\alpha = 0.05$  significance level. (If required, use  $Z_{\frac{0.05}{2}} = \pm 1.96$ ,  $Z_{0.05} = 1.645$ )

Q4: A teacher wants to know whether three different teaching methods produce different mean test scores. She randomly assigns 15 students into 3 groups (5 students per group). The test scores are:

| Method A | Method B | Method C |
|----------|----------|----------|
| 12       | 22       | 17       |
| 15       | 20       | 15       |
| 14       | 19       | 16       |
| 10       | 24       | 18       |
| 13       | 21       | 14       |

At the 5% significance level, test whether the mean test scores are the same across the three methods. (Use  $F_{0.05,2,12} = 3.89$ ,  $F_{0.05,3,12} = 3.49$ ,  $F_{0.05,2,13} = 3.81$ )

Q5: According to a report by Scarborough Research, the average monthly household cellular phone bill is \$60. Suppose local monthly household cell phone bills are normally distributed with a standard deviation of \$11.35.

- What is the probability that a randomly selected monthly cell phone bill is more than \$85?
- What is the probability that a randomly selected monthly cell phone bill is between \$45 and \$70?

Q6: A company produces two types of products, Product A and Product B. The company has two machines, Machine 1 and Machine 2, and the time (in hours) required to produce each unit of each product on each machine is given below:

Machine 1: Product A: 2 hours Product B: 1 hour

Machine 2: Product A: 1 hour Product B: 3 hours

The company has a total of 60 hours available on Machine 1 and 40 hours available on Machine 2 per week. The profit for each unit of Product A is \$5, and for Product B is \$4. Formulate a linear programming problem to maximize the profit and find the optimal production quantities for Products A and B.

Q7: A bank branch recorded average daily footfall (X, persons) and total daily new deposits (Y, in ₹10,000) for 7 days:

X: 50, 60, 55, 70, 65, 80, 75

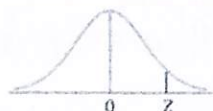
Y: 12, 14, 13, 17, 16, 20, 19

Find equation of regression line and estimate deposits when footfall is 68.

Q8: Write short note on (any two):

- Chi-Square Test
- Components of Time Series
- Binomial Distribution

# Areas of the Standard Normal Distribution



The entries in this table are the probabilities that a standard normal random variable is between 0 and  $z$  (the shaded area).

| $z$ | 0.00  | 0.01  | 0.02  | 0.03  | 0.04  | 0.05  | 0.06  | 0.07  | 0.08  | 0.09  |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.5 | .1915 | .1950 | .1985 | .2019 | .2054 | .2088 | .2123 | .2157 | .2190 | .2224 |
| 0.6 | .2257 | .2291 | .2324 | .2357 | .2389 | .2422 | .2454 | .2486 | .2517 | .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 |
| 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 |