

Even Semester Theory Examination, 2019-20
(COVID Impacted Session)

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Structure/Format of Question Papers
(COVID Impacted Session)

1. All the Question Papers will be of TWO hours duration.
2. There shall be **TWO** questions.
3. **Question 1** will have **12 (TWELVE) parts** out of which **8 (EIGHT) parts** will have to be answered by the students.
 - There will be **at least TWO parts** from **each Unit** of the Syllabus.
 - All Parts of this question will be of **Short Answer Type** questions.
 - **Expected solving time** for each part will be approximately **8 minutes**, thus requiring **64 minutes** for the **Question 1**.
4. **Question 2** will have **5 (FIVE) parts** out of which **3 (THREE) parts** will have to be answered by the students.
 - There will be exactly **ONE question** from each Unit of the Syllabus.
 - All parts of this question will be of **Moderate Answer Type** questions.
 - **Expected solving time** for each part will be approximately **15 minutes**, thus requiring **45 minutes** for the **Question 2**.
5. **Distribution of Marks** will be as follows.
 - a. **For 70 Marks question paper:**
Question 1: 5 marks * 8 parts = 40 Marks.
Question 2: 10 marks * 3 parts = 30 Marks.
 - b. **For 100 Marks question paper:**
Question 1: 8 marks * 8 parts = 64 Marks.
Question 2: 12 marks * 3 parts = 36 Marks.
6. Sample question papers outlining the structure of a typical question paper for 70 Marks subject and 100 marks subjects are given for reference at page 3 and page 5 respectively.

Sample Question Paper
For subjects of 70 Marks (2 hours) Question Papers

B.Tech/ M.Tech./MCA
(SEM VIII) EVEN SEMESTER EXAMINATION 2019-20
SUBJECT NAME

[TIME: 2 hrs.]

[Max. Marks: 70]

Note: *Attempt All Questions.*

Question 1.

5 x 8 = 40

This question contains *Twelve* Parts. Answer **any EIGHT** parts. Each part carries **5 Marks**.

- (a) Explain the following terms.
Rate of Convergence, Truncation Error
- (b) Show at least one scenario through graphical sketch when choice of initial guess in Newton Raphson method may lead to divergence or endless cycle.
- (c) Performing three iteration of the bisection method, find the one real root of the given equation in the interval **[0, 4]**.
$$x^3 - 3x^2 + 1 = 0$$
- (d) What do you understand by ill-conditioned system of equations?
- (e) Find the unique polynomial **P(x)** of degree **2** or less using the Lagrange interpolation method such that **P(1) = 1, P(3) = 27, P(4) = 64**.
- (f) Prove the following relation between forward difference operator and backward difference operator.
$$\Delta + \nabla = \Delta / \nabla - \nabla / \Delta$$
- (g) Explain the principle of least squares for curve fitting.
- (h) Express x^2 in terms of Chebyshev polynomials.
- (i) Write the Trapezoidal Formula to find integration of any given function.
- (j) Compare the local errors in the Trapezoidal Rule and Simpson's 1/3 rule of integration.
- (k) Prove that if every number in a sequence is multiplied by a nonzero constant, the moving average is also multiplied by this constant.
- (l) Define the following terms.
Type-II Error, Level of significance

Question 2.

10 x 3 = 30

This question contains *Five* parts. Answer **any THREE** parts. Each part carries **10 Marks**.

- (a) Perform three iterations of the Newton Raphson method with initial guess of **3** to find the approximate value of cube root of **23**.

- (b) Using Gauss elimination method with partial pivoting, solve the following system of simultaneous equations

$$\begin{aligned} x + y - z &= 2 \\ 2x + 3y + 5z &= -3 \\ 3x + 2y - 3z &= 6 \end{aligned}$$

- (c) Using the principle of least squares fit, find an equation of the form $y = a + bx$ that fits best the given data.

X	1	2	3	4
Y	21	11	7	6

- (d) Evaluate the following integral using Simpson's 1/3 method taking stepsize $h = 0.5$.
 $I = \int_0^2 dx / (x^2 + 2x + 10)$

- (e) Following table shows the observed and expected frequencies in tossing a dice 120 times. Test the hypotheses that dice is fair, using significance level of 0.05.

Face	1	2	3	4	5	6
Observed Frequency	25	17	15	23	24	16
Expected Frequency	20	20	20	20	20	20

Given that for 5 degrees of freedom, value of chi-square (χ^2) at 0.95 and at 0.05 are 11.1 and 1.15 respectively.

Sample Question Paper
For subjects of 100 Marks (2 hours) Question Papers

MBA
(SEM IV) EVEN SEMESTER EXAMINATION 2019-20
SUBJECT NAME

[TIME: 2 hrs.]

[Max. Marks: 100]

Note: Attempt All Questions.

Question 1.

8 x 8 = 64

This question contains *Twelve* Parts. Answer **any EIGHT** parts. Each part carries **8 Marks**.

- (a) Explain the following terms.
Rate of Convergence, Truncation Error
- (b) Show at least one scenario through graphical sketch when choice of initial guess in Newton Raphson method may lead to divergence or endless cycle.
- (c) Performing three iteration of the bisection method, find the one real root of the equation in the interval **[0, 4]**.
$$x^3 - 3x^2 + 1 = 0$$
- (d) What do you understand by ill-conditioned system of equations?
- (e) Find the unique polynomial **P(x)** of degree **2** or less using the Lagrange interpolation method such that **P(1) = 1, P(3) = 27, P(4) = 64**.
- (f) Prove the following relation between forward difference operator and backward difference operator.
$$\Delta + \nabla = \Delta / \nabla - \nabla / \Delta$$
- (g) Explain the principle of least squares for curve fitting.
- (h) Express **x²** in terms of Chebyshev polynomials.
- (i) Write the Trapezoidal Formula to find integration of any given function.
- (j) Compare the local errors in the Trapezoidal Rule and Simpson's 1/3 rule of integration.
- (k) Prove that if every number in a sequence is multiplied by a nonzero constant, the moving average is also multiplied by this constant.
- (l) Define the following terms.
Type-II Error, Level of significance

Question 2.

12 x 3 = 36

This question contains *Five* parts. Answer **any THREE** parts. Each part carries **12 Marks**.

- (a) Perform three iterations of the Newton Raphson method with initial guess of **3** to find the approximate value of cube root of **23**.

- (b) Using Gauss elimination method with partial pivoting, solve the following system of simultaneous equations

$$\begin{aligned} x + y - z &= 2 \\ 2x + 3y + 5z &= -3 \\ 3x + 2y - 3z &= 6 \end{aligned}$$

- (c) Using the principle of least squares fit, find an equation of the form $y = a + bx$ that fits best the given data.

X	1	2	3	4
Y	21	11	7	6

- (d) Evaluate the following integral using Simpson's 1/3 method taking stepsize $h=0.5$.

$$I = \int_0^2 \frac{dx}{x^2+2x+10}$$

- (e) Following table shows the observed and expected frequencies in tossing a dice 120 times. Test the hypotheses that dice is fair, using significance level of 0.05.

Face	1	2	3	4	5	6
Observed Frequency	25	17	15	23	24	16
Expected Frequency	20	20	20	20	20	20

Given that for 5 degrees of freedom, value of chi-square (χ^2) at 0.95 and at 0.05 are 11.1 and 1.15 respectively.
