

08/01/2021/III/R-2019/CSC301/EM III /MCQ

R-2019 /CBSGS / SE / CE / III/ CSC301 /Engineering Mathematics-III- University of Mumbai Online Examination 2020

Please note before you attempt examination:

1. This is 80 marks (40 marks MCQs and 40 marks descriptive) examination for 2 hours duration. 40 minutes for solving MCQ questions and remaining 80 minutes for descriptive questions. The link will get automatically disabled after 2 hours. You will get 10 minutes extra time for uploading the pdf.
2. After submitting MCQs within 40 minutes, you have to click on to the link given in response message to enter into descriptive question section.
3. The link of descriptive question will be enabled only after 40 minutes from start of the test. You will be getting 80 minutes to solve this section.
4. You have to fill the mandatory information first before attempting the quiz.
5. In MCQ section, the total marks are assigned is 40 for 20 MCQs which are compulsory and each question carry 2 marks (total 40 marks).
6. For descriptive question (Q.2 and Q.3), total marks assigned are 40 (20 marks each), you need to write the answers in legible handwriting on A4 paper. After completion of all the answers, you need to write the semester and subject name along with your correct seat number, duly signed by you and page number in typical format (current page number/ total pages) e.g. 1/5 or 3/7 (1 and 3 indicates current page number and 5 and 7 indicates total number of pages respectively on which answers are written) on each and every page.
7. Use scanning app to scan the question wise answers in PDF and upload the same using the specific link provided in the MS forms.
8. Use only college gst.sies.edu.in Email ID to appear for examination.
9. Keep your Hall Ticket and/or college ID/ID proof/Fee Receipt with you while appearing for this examination.

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Hi SHINIT, when you submit this form, the owner will be able to see your name and email address.

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SE/ CE/III/ R-2019 SH 2020



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Name of the subject with subject code *

Engineering Mathematics-III/ CSC301



6

Question *
(2 Points)

| | |
|-----------|---|
| | The value of $\int_0^{\infty} e^{-3t} \left(\frac{\sinh t}{t} \right) dt$ is |
| Option A: | $\frac{1}{3} \ln 3$ |
| Option B: | $\frac{1}{3} \ln \left(\frac{1}{3} \right)$ |
| Option C: | $\frac{1}{2} \ln 2$ |
| Option D: | $\frac{1}{2} \ln \left(\frac{1}{2} \right)$ |

- ☐ Option A
- ☐ Option B
- ☒ Option C
- ☐ Option D

7

Question *
(2 Points)

| | |
|-----------|--|
| . | Fourier coefficient b_1 for $f(x) = x.\sin x$, where $x \in (0, 2\pi)$ is |
| Option A: | 0 |
| Option B: | π |
| Option C: | $-\pi$ |
| Option D: | $\frac{\pi}{\sqrt{2}} - \frac{\pi}{\sqrt{3}}$ |

☒ Option A

☐ Option B

☐ Option C

☐ Option D

8

Question *
(2 Points)

| | |
|-----------|--|
| | A continuous random variable X has the $f(x) = k^2 x^3$, $0 \leq x \leq 3$, $k > 0$ then value of k is |
| Option A: | 2/81 |
| Option B: | 4/81 |
| Option C: | 4/9 |
| Option D: | 2/9 |

☐ Option A

☐ Option B

☐ Option C

☒ Option D

9

Question *

(2 Points)

| | |
|-----------|--|
| | A random variable X has probability distribution with $E(X) =$ then variance is |
| Option A: | 0.75 |
| Option B: | 1.5 |
| Option C: | 3 |
| Option D: | 5.25 |

- ☒ Option A
- ☐ Option B
- ☐ Option C
- ☐ Option D

10

Question *

(2 Points)

| | |
|-----------|---|
| | Value of constant real number m such that $f(z) = f(x + iy) = e^{3mx+2iy}$ is analytic function is |
| Option A: | 2/3 |
| Option B: | -2/3 |
| Option C: | 3/2 |
| Option D: | -3/2 |

- ☒ Option A
- ☐ Option B

☐ Option C

☐ Option D

11

Question *
(2 Points)

| | |
|-----------|--|
| | For real variables x, y function $u(x, y) = 2xy$ |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| Option A: | does not satisfy Laplacian equation. |
| Option B: | is not continuous. |
| Option C: | is harmonic. |
| Option D: | is continuous but not partially differentiable. |

☐ Option A

☐ Option B

☒ Option C

☐ Option D

12

Question *

(2 Points)

| | |
|-----------|--|
| | Laplace transform of $\int_0^t \sin 2t \cosh 2t \, dt$ is |
| Option A: | $\frac{1}{s} \left[\frac{1}{(s-2)^2 - 4} - \frac{1}{(s+2)^2 - 4} \right]$ |
| Option B: | $\frac{1}{s} \left[\frac{1}{(s-2)^2 - 4} + \frac{1}{(s+2)^2 - 4} \right]$ |
| Option C: | $\frac{1}{s} \left[\frac{1}{(s-2)^2 + 4} - \frac{1}{(s+2)^2 + 4} \right]$ |
| Option D: | $\frac{1}{s} \left[\frac{1}{(s-2)^2 + 4} + \frac{1}{(s+2)^2 + 4} \right]$ |

- ☐ Option A
- ☐ Option B
- ☐ Option C
- ☒ Option D

13

Question *

(2 Points)

| | |
|-----------|---|
| | $L^{-1} \left[\frac{s+2}{s^2+4s+5} \right]$ is |
| Option A: | $e^{-2t} \cos t$ |
| Option B: | $e^{-2t} \sin t$ |
| Option C: | $e^{2t} \cos t$ |

Option D: | $e^{-t} \sin t$

- ☒ Option A
- ☐ Option B
- ☐ Option C
- ☐ Option D

14

Question *
(2 Points)

| | |
|-----------|--|
| | The coefficient of rank correlation between two unequal ranks is -0.9 . If the number of pairs is 5 , squares of differences in ranks is |
| Option A: | 37 |
| Option B: | 36 |
| Option C: | 39 |
| Option D: | 38 |

- ☐ Option A
- ☐ Option B
- ☐ Option C
- ☒ Option D

15

Question *
(2 Points)

Laplace transform of $f(t) = t^2 e^{-t}$ is

| | |
|-----------|-----------------------------|
| Option A: | $\frac{2}{(s-1)^3}$ |
| Option B: | $\frac{2}{(s+1)^3}$ |
| Option C: | $\frac{\Gamma(2)}{(s-1)^3}$ |
| Option D: | $\frac{\Gamma(2)}{(s+1)^3}$ |

- ☐ Option A
- ☒ Option B
- ☐ Option C
- ☐ Option D

16

Question *

(2 Points)

| | |
|-----------|---|
| . | Inverse Laplace transform of $\frac{s-1}{s^2}$ is |
| Option A: | $-1 - t$ |
| Option B: | $-1 + t$ |
| Option C: | $1 + t$ |
| Option D: | $1 - t$ |

- ☐ Option A
- ☐ Option B

☐ Option C

☒ Option D

17

Question *
(2 Points)

| | |
|-----------|---|
| | For $f(z) = \sin x \cosh(y) + i \cos x \sinh(y)$, where $z = x + iy$, |
| Option A: | $-\sin z$ |
| Option B: | $\sinh z$ |
| Option C: | $\cos z$ |
| Option D: | $\cosh z$ |

☐ Option A

☐ Option B

☒ Option C

☐ Option D

18

Question *
(2 Points)

| | | | | | |
|-----------|--|---|---|---|---|
| | If a straight line is $y=ax+b$ is fitted to following data | | | | |
| | x | 0 | 1 | 2 | 3 |
| | y | 1 | 2 | 3 | 4 |
| | Then values of a & b are | | | | |
| Option A: | a=1, b=0 | | | | |

| | |
|-----------|-------------|
| Option B: | $a=1, b=1$ |
| Option C: | $a=0, b=1$ |
| Option D: | $a=-1, b=1$ |

- ☐ Option A
- ☒ Option B
- ☐ Option C
- ☐ Option D

19

Question *

(2 Points)

| | | | | | |
|-----------|--|------|------|------|-----|
| | If random variable X has the probability distribution as | | | | |
| | X | -2 | -1 | 0 | 1 |
| | $P(X=x)$ | $3k$ | $2k$ | $2k$ | k |
| | Then $P(-2 < X \leq 2)$ is | | | | |
| Option A: | 1 | | | | |
| Option B: | 0.7 | | | | |
| Option C: | 0.8 | | | | |
| Option D: | 0.5 | | | | |

- ☐ Option A
- ☒ Option B
- ☐ Option C
- ☐ Option D

20

Question *

(2 Points)

| | |
|-----------|---|
| | |
| | $L^{-1} \left[\frac{s(2s^2 - 3)}{(s^2 + 1)(s^2 - 4)} \right]$ is |
| | |
| | |
| | |
| Option A: | $\cos ht + \cosh 2t$ |
| Option B: | $\cos t + \cosh 2t$ |
| Option C: | $\cos t + \cos 2t$ |
| Option D: | $\cos ht + \cos 2t$ |

- ☒ Option A
- ☐ Option B
- ☐ Option C
- ☐ Option D

21

Question *

(2 Points)

| | |
|-----------|--|
| | Fourier coefficient a_2 for $f(x)=x$, x belongs to $(-1, 1)$ is |
| Option A: | -1 |
| Option B: | 1 |
| Option C: | 0 |
| Option D: | 2 |

- ☐ Option A
- ☐ Option B
- ☒ Option C
- ☐ Option D

22

Question *

(2 Points)

| | |
|-----------|---|
| | Laplace transform of $\cos(\sqrt{3}t)$ is |
| Option A: | $\frac{s}{s^2 + 9}$ |
| Option B: | $\frac{s}{s^2 - 9}$ |
| Option C: | $\frac{s}{s^2 + 3}$ |
| Option D: | $\frac{s}{s^2 - 3}$ |

- ☐ Option A

☐ Option B

☒ Option C

☐ Option D

23

Question *
(2 Points)

| | |
|-----------|--|
| | Fourier coefficient a_0 in half range cosine series for $f(x) = e^x$, |
| Option A: | $e+1$ |
| Option B: | $-e-1$ |
| Option C: | $-e+1$ |
| Option D: | $e-1$ |

☐ Option A

☐ Option B

☐ Option C

☒ Option D

24

Question *
(2 Points)

| | |
|-----------|---|
| | If coefficients of correlation between variables x, y is 0.5 and regression b_{xy} is 0.2 then coefficient of correlation b_{yx} is |
| Option A: | 1.25 |
| Option B: | -1.25 |

| | |
|-----------|------|
| Option C: | 2.5 |
| Option D: | -2.5 |

- ☒ Option A
- ☐ Option B
- ☐ Option C
- ☐ Option D

25

Question *

(2 Points)

| | |
|-----------|-------------------------|
| | $L^{-1}(\tan^{-1}s)$ is |
| Option A: | $\frac{\sin t}{t}$ |
| Option B: | $\frac{\cos t}{t}$ |
| Option C: | $-\frac{\sin t}{t}$ |
| Option D: | $-\frac{\cos t}{t}$ |

- ☐ Option A
- ☐ Option B
- ☒ Option C
- ☐ Option D

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