

# Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021)

Course Name - –Mathematics II

Course Code - DCSE204

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- M.SC.(MM)
- B.A.(Eng)

Answer all the questions. Each question carry one mark.

9. 1.

$$\int e^{e^x+x} dx =$$

Mark only one oval.

$$e^{e^x} + c$$

Option 1

$$e^x + c$$

Option 2

$$e^x + \frac{x^2}{2} + c$$

Option 3

none of these

10. 2.

$$\int \frac{\cos 2x dx}{(\sin x + \cos x)^2} =$$

Mark only one oval.

$$\log |\sin x + \cos x|$$

Option 1

$$\log |\sin x - \cos x|$$

Option 2

$$-\log |\sin x + \cos x|$$

Option 3

None of these

11. 3.

$$\int 2^{3x} dx =$$

Mark only one oval.

$$\frac{2^{3x}}{3 \log 2} + c$$

 Option 1

$$\frac{2^{3x+1}}{3x+1} + c$$

 Option 2

$$3 \cdot 2^{3x} \log 2 + c$$

 Option 3 None of these

12. 4.

$$\int \cot^2 x dx =$$

Mark only one oval.

- $-(\cot x + x) + c$
- $-(\cot x - x) + c$
- $-\cot x + x + c$
- None of these



13. 5.

$$\int \frac{2 \tan x}{1 + \tan^2 x} dx =$$

Mark only one oval.

$$\frac{1}{2} \cos 2x + c$$

Option 1

$$\frac{1}{2} \sin 2x + c$$

Option 2

$$-\frac{1}{2} \cos 2x + c$$

Option 3

$$\frac{1}{2} \sec^2 2x + c$$

Option 4

14. 6.

$$\int \tan^{-1}\left(\frac{\sin 2x}{1+\cos 2x}\right) dx =$$

Mark only one oval.

$$\frac{x}{2} + c$$

 Option 1 x+c

$$x^2 + c$$

 Option 3

$$\frac{x^2}{2} + c$$

 Option 4

15. 7.

$$\int e^{3\log x} dx =$$

Mark only one oval.

$$x^3 + c$$

Option 1

$$\log x + c$$

Option 2

$$\frac{x^4}{4} + c$$

Option 3

$$x^4 + c$$

Option 4

16. 8.

The formula  $\int a^x dx = \frac{a^x}{\log a} + c$  is invalid for a=

Mark only one oval.

1

2

3

None of these

17. 9.

$$\int \frac{e^{2\tan^{-1}x}}{1+x^2} dx =$$

Mark only one oval.

$$e^{2\tan^{-1}x}$$

Option 1

$$\frac{x}{1+x^2}$$

Option 2

$$\frac{1}{2}e^{2\tan^{-1}x}$$

Option 3

none of these

18. 10.

$$\int \sin^{-1}(\cos x) dx =$$

Mark only one oval.

$$\frac{\pi}{2}x - \frac{x^2}{2} + c$$

Option 1

$$\frac{\pi}{2}x + \frac{x^2}{2} + c$$

Option 2

$$-\frac{\pi}{2}x - \frac{x^2}{2} + c$$

Option 3

None of these

19. 11.

$$\int e^{1-\log x} dx =$$

Mark only one oval.

- $ex+c$
- $e\log x+c$
- $x\log e+c$
- None of these

20. 12.

$$\int x e^x dx =$$

Mark only one oval.

$$x e^x + e^x + c$$

Option 1

$$2 e^x + c$$

Option 2

$$x e^x - e^x + c$$

Option 3

None of these



21. 13.

$$\int x \cos x dx =$$

Mark only one oval.

$$x \sin x - \cos x + c$$

 Option 1

$$x \sin x + \cos x + c$$

 Option 2

$$x \sin x + \sec x + c$$

 Option 3

$$-\sin x + \cos x + c$$

 Option 4

22. 14.

$$\int_1^2 \frac{x+1}{x^3} dx$$

Mark only one oval.

$$\frac{6}{7}$$

Option 1

$$\frac{7}{8}$$

Option 2

$$\frac{1}{9}$$

Option 3

None of these

23. 15.

$$\int_0^{\frac{\pi}{2}} \cos^2 x dx =$$

Mark only one oval.

$$\frac{\pi}{2}$$

Option 1

$$\frac{\pi}{3}$$

Option 2

$$\frac{\pi}{6}$$

Option 3

$$\frac{\pi}{4}$$

Option 4

24. 16.

$$\int_0^{\frac{\pi}{2}} \sin x dx =$$

Mark only one oval.

0

1

-1

None of these

25. 17.

$$\int_0^{\frac{\pi}{4}} \tan^2 x dx =$$

Mark only one oval.

$$1 - \frac{\pi}{4}$$

Option 1

$$1 + \frac{\pi}{4}$$

Option 2

$$-\frac{\pi}{4}$$

Option 3

$$\frac{\pi}{4}$$

Option 4

26. 18.

$$\int_0^1 \frac{dx}{1+x^2} =$$

Mark only one oval.

$$\frac{\pi}{4}$$

Option 1

$$\frac{\pi}{2}$$

Option 2

$$\frac{2\pi}{3}$$

Option 3

None of these

27. 19.

$$\int_0^{\frac{\pi}{2}} \sin^2 x dx =$$

Mark only one oval.

 0 1

$\frac{\pi}{4}$

 2 Option 4

28. 20.

The order and degree of the differential equation  $\left(\frac{dy}{dx}\right)^2 - 2\frac{dy}{dx} = 3x$  are

Mark only one oval.

- 2,1
- 2,2
- 1,1
- 1,2

29. 21.

The order and degree of the differential equation  $\left(\frac{d^2y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^3 + y = 0$  are

Mark only one oval.

- 2,3
- 2,1
- 2,2
- 1,3

30. 22. \_\_\_\_\_

The order and degree of the differential equation  $\left(\frac{d^2y}{dx^2}\right) = \left(1 + \frac{dy}{dx}\right)^{\frac{2}{3}}$  are

Mark only one oval.

- 2,3
- 3,2
- 1,3
- None of these



31. 23.

The general solution of the differential equation  $\frac{d^2y}{dx^2} + x\frac{dy}{dx} = 0$  contains

Mark only one oval.

- 1 arbitrary constant
- 2 arbitrary constant
- 3 arbitrary constant
- 4 arbitrary constant

32. 24. The differential equation whose general solution is  $y = A \sin x$  is

Mark only one oval.

$$\frac{dy}{dx} = y \cos x$$

$$\frac{dy}{dx} = y \cot x$$

Option 1

Option 2

$$\frac{dy}{dx} = y \tan x$$

Option 3

None of these

33. 25.

The differential equation whose general solution is  $y = Ae^x + Be^{-x}$  is

Mark only one oval.

$$\frac{d^2y}{dx^2} = -y$$

Option 1

$$\frac{dy}{dx} = Ae^x - Be^{-x}$$

Option 2

$$\frac{d^2y}{dx^2} = y$$

Option 3

None of these

34. 26.

The general solution of  $(x+2)dx+(y+3)dy=0$  is

Mark only one oval.

$$x^2 + 4x + 6y = 0$$

Option 1

$$x^2 + y^2 + 4x + 6y = 0$$

Option 2

$$x^2 + y^2 + 4x + 6y = c$$

Option 3

None of these

35. 27. The general solution of  $xy - ydx = 0$  is

Mark only one oval.

$$y^2 + x^2 = c^2$$

Option 1

$$y^2 = Ax^2$$

Option 2

$$y^2 = Ax$$

Option 3

$$y^2 = -x$$

Option 4

36. 28.

If  $\frac{dy}{dx} = y$  then  $y =$

Mark only one oval.

$ce^{-x}$

 Option 1  $cx$ 

$ce^x$

 Option 3  $\text{clog}x$

37. 29.

If  $\frac{dy}{dx} = -\frac{y}{x}$  and  $y=2$  at  $x=2$  then  $y=$

Mark only one oval.

$$\frac{4}{x}$$

Option 1

$$\frac{1}{x}$$

Option 2

$$x^2$$

Option 3

x

38. 30.

The general solution of  $\frac{dy}{dx} = \frac{x^2}{y^2}$  is

Mark only one oval.

$$x^3 + y^3 = c$$

Option 1

$$x^3 - y^3 = c$$

Option 2

$$x^2 + y^2 = c$$

Option 3

$$x^2 - y^2 = c$$

Option 4

39. 31.

The general solution of the differential equation  $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$  is

Mark only one oval.

$$y = \tan^{-1} x + c$$

Option 1

$$x = \tan^{-1} y + c$$

Option 2

$\tan(xy) = c$

$y - x = c(1 + xy)$



40. 32.

Integrating factor of  $(x^2 + y^2 + x) dx + xy dy = 0$  is

Mark only one oval.

 X Y  $x^2$   $y^2$  Option 3 Option 4

41. 33.

Integrating factor of  $2xydx + (y^2 - x^2)dy = 0$  is

Mark only one oval.

$$\frac{1}{x^2}$$

Option 1

$$\frac{1}{y^2}$$

Option 2

$$\frac{1}{x}$$

Option 3

$$\frac{1}{y}$$

Option 4

42. 34.

Solution of  $x dx + y dy + (x^2 + y^2) x dx = 0$  is

Mark only one oval.

$$x^2 + y^2 = C$$

Option 1

$$\log(x^2 + y^2) + x^3 = C$$

Option 2

$$\log(x^2 + y^2) + x^2 = C$$

Option 3

None of These

43. 35.

The integrating factor of the equation  $\frac{dx}{dy} + \frac{x}{1+y^2} = \frac{e^{-\tan^{-1}y}}{1+y^2}$  is

Mark only one oval.

  
 $\tan^{-1}y$ 

Option 1

  
 $e^{\tan y}$ 

Option 2

  
 $e^{\sin^{-1}y}$ 

Option 3

  
 $e^{\tan^{-1}y}$ 

Option 4

44. 36.

The CF of  $(D^2 + 4)Y = x^2$  is

Mark only one oval.

$$C_1 \cos 2x + C_2 \sin 2x$$

Option 1

$$C_1 \cos x + C_2 \sin x$$

Option 2

$$C_1 \cos 4x + C_2 \sin 4x$$

Option 3

$$C_1 \cos 4x + C_2 \sin 4x$$

Option 4

45. 37.

$$\frac{1}{D} \left( x^{\frac{5}{2}} \right) =$$

Mark only one oval.

$$\frac{7}{2} x^{\frac{7}{2}}$$

Option 1

$$\frac{2}{7} x^{\frac{7}{2}}$$

Option 2

$$x^{\frac{7}{2}}$$

Option 3

$$x^{\frac{7}{2}}$$

Option 4

46. 38. Condition for independence of two events A and B is

Mark only one oval.

$$P(A \cap B) = P(A) \cdot P(B)$$

Option 1

$$P(A+B) = P(A) \cdot P(B)$$

Option 2

$$P(A-B) = P(A) \cdot P(B)$$

Option 3

$$P(A \cap B) = P(A) \cdot P(B|A)$$

Option 4

47. 39.

If  $P(A+B) = \frac{2}{7}$  then the probability of  $P(\bar{A} \cdot \bar{B})$  is

Mark only one oval.

$$\frac{1}{7}$$

Option 1

$$\frac{2}{7}$$

Option 2

$$\frac{5}{7}$$

Option 3

None of these



48. 40.

The probability of any event  $A$  satisfies  
Mark only one oval.

$$P(A) \geq 1$$

 Option 1

$$P(A) < 0$$

 Option 2

$$0 \leq P(A) \leq 1$$

 Option 3 None of these

49. 41. Probability of obtaining an even number in the throw of a fair die is

*Mark only one oval.*

$$\frac{1}{4}$$

Option 1

$$\frac{2}{5}$$

Option 2

$$\frac{1}{2}$$

1

Option 4

50. 42.

If  $P(A \cup B) = \frac{7}{8}$ ,  $P(A \cap B) = \frac{1}{4}$ ,  $P(A^c) = \frac{5}{8}$  then  $P(B) =$

Mark only one oval.

$$\frac{3}{8}$$

Option 1

$$\frac{3}{4}$$

Option 2

$$\frac{1}{3}$$

Option 3

$$\frac{1}{4}$$

Option 4

51. 43. If two events are exhaustive then

*Mark only one oval.*

$$P(A \cap B) = 1$$

Option 1

$$P(A \cup B) = 1$$

Option 2

$$P(A \cap B) = 0$$

Option 3

$$P(A \cup B) = 0$$

Option 4

52. 44. Probability of an event is 1. Then the event is

*Mark only one oval.*

impossible events

event space itself

(a) or (b)

none of these

53. 45. One card is drawn from a standard pack of 52. The probability which is either king or a queen is

*Mark only one oval.*

$$\frac{1}{3}$$

Option 1

$$\frac{2}{13}$$

Option 2

$$\frac{3}{13}$$

Option 3

None of these

54. 46. Two unbiased coins are tossed. Then the probability of obtaining at least one tail is

Mark only one oval.

$$\frac{4}{3}$$

Option 1

$$\frac{3}{4}$$

Option 2

$$\frac{1}{3}$$

Option 3

None of these

55. 47. A die is thrown once, then the probability of obtaining a 'six' is

*Mark only one oval.*

$$\frac{1}{3}$$

Option 1

$$\frac{1}{2}$$

Option 2

$$\frac{1}{6}$$

Option 3

None of these

56. 48. The probability of getting at least one of the following events , point 'six' or 'one' on the top in rolling of an unbiased die once is

*Mark only one oval.*

$$\frac{1}{6}$$

$$\frac{1}{9}$$

Option 1

Option 2

Option 3

None of these



57. 49.

Let A and B be two events and  $P(\bar{A}) = 0.3, P(B) = 0.4, P(\bar{A} \cap \bar{B}) = 0.5$ ; then  $P(A + \bar{B}) =$

Mark only one oval.

- 0.5
- 0.8
- 1
- none of these

58. 50. An urn contains 4 white and 6 black balls. Two balls are drawn one after another without replacement. Probability of one ball white and one black is

*Mark only one oval.*

$$\frac{1}{24}$$

Option 1

$$\frac{4}{15}$$

Option 2

$$\frac{8}{15}$$

Option 3

None of these

59. 51.

Median of the frequency distribution

$$x_i : 3 \quad 2 \quad 5 \quad 1$$

$$f_i : 2 \quad 1 \quad 1 \quad 3$$

Mark only one oval.

$$\frac{16}{7}$$

 5 Option 2

$$\frac{1}{2}$$

$$\frac{7}{16}$$

 Option 3 Option 4

60. 52.

If  $y=5x-20$  and  $\bar{x}=30$  then the value of  $\bar{y}$

Mark only one oval.

- 130
- 140
- 30
- none of these

61. 53. The mode of the observations 2,1,1,2,3,5,2,1,2,6,4,2,1,3 is

Mark only one oval.

- 3
- 4
- 2
- 1

62. 54.

The mode of the frequency distribution

$x_i$ : 0    1    2    3    4

$f_i$ : 23   24   21   25   20

Mark only one oval.

- 0
- 1
- 2
- 3

63. 55. The variance of 1,5,6 is

*Mark only one oval.*

3.67

4.67

9.1

0.67

64. 56.

$2x+y=3$  is the relation between two variables  $x$  and  $y$ . If  $\sigma_x = 3$  then  $\sigma_y =$

*Mark only one oval.*

3

4

6

None of these

65. 57. The relation among mean, median and mode is

*Mark only one oval.*

Mode=3 Median-2 Mean

Mode=3 Median+2 Mean

Mode=2 Median-3 Mean

Mode=2 Median + 3 Mean

66. 58.

If  $10\bar{y} = \bar{x} - 85$  and  $\bar{y} = -0.523$  then  $\bar{x} =$

Mark only one oval.

80

79.77

80.77

75.72

67. 59. If  $\text{var}(x) = 5$  and  $y = 5x + 6$  then  $\text{var}(y) =$ 

Mark only one oval.

125

150

6

None of these

68. 60. Which of the following digits are not significant of the number 0.025

Mark only one oval.

0

2

5

None of these

69. 61. The number of significant digit in the number 3.0056 is

*Mark only one oval.*

3

4

5

2

70. 62. Newton' s forward interpolation formula is use to interpolate

*Mark only one oval.*

near end

near central position

near beginning

none of these

71. 63. Lagrange's interpolation formula deals with

*Mark only one oval.*

Equispaced arguments only

Unquispaced arguments only

both (a) and (b)

none of these

72. 64. The degree of the interpolation polynomial of a function whose values are known at 8 points is

*Mark only one oval.*

5

6

7

8

73. 65. Trapezoidal rule can be applied if the number of equal sub-intervals of the interval of integration is

*Mark only one oval.*

odd

even

both

none of these

74. 66. The degree of precision of Simpson's one third rule is

*Mark only one oval.*

1

2

3

5



75. 67. After rounding off to three places of decimals the number 57.1092 becomes

*Mark only one oval.*

57.109

57.100

57.110

0.109

76. 68. After being rounded off to two places of decimals the number 8.1083 becomes

*Mark only one oval.*

8.10

0.11

8.11

none of these

77. 69. After being rounded off to four places of decimals the number 3.4506531 becomes

*Mark only one oval.*

3.4506

3.4507

3.451

none of these

78. 70. Bisection method used for finding the real root of a transcendental equation is

*Mark only one oval.*

- an analytical method
  - graphical method
  - iterative method
  - None of these
- 

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