

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

Course Name - Mathematics II

Course Code - DCSE204

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Mark only one oval.

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- M.SC.(ANCS)
- 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.

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

Option 1

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

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 $xdy-ydx=0$ 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

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