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

Course Name - –Algebra and Calculus
Course Code - BCA203C

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Answer all the questions. Each question carry one mark.

9. 1. The greatest common divisor (gcd) of 7649 and 2464 is

Mark only one oval.

- 2
- 11
- 1
- None of these

10. 2.

$$\frac{1}{D^2-2D+5}(10\sin x)=$$

Mark only one oval.

$\sin x+\cos x$

Option 1

$3\sin x-\cos x$

Option 2

$2\sin x+\cos x$

Option 3

$4\sin x$

Option 4

11. 3. For all odd integer a, gcd(3a,3a+2)=

Mark only one oval.

- 1
- 2
- 3
- None of these

12. 4. If a and b not both zero,are relatively prime , then for integers u and v,au+bv=

Mark only one oval.

- -1
- 1
- a-b
- a+b

13. 5. Every integer is relatively prime to

Mark only one oval.

- 1
- 0
- 2
- None of these

14. 6. The remainder when the sum 4!+5!+6!+...+50! is divided by 4 is

Mark only one oval.

- 1
- 2
- 3
- 0

15. 7. The number of integral solutions of the equation 24x+16y=2 is

Mark only one oval.

- unique
- nil
- finite
- infinite

16. 8. The linear equation 51x+6y=8 has no integral solution because gcd(51,6)=3 and

Mark only one oval.

- 3 does not divide 8
- 3 divides 51
- 3 divides 6
- None of these

17. 9. If 3x + 4= 9(mod 17) then one possible value of x is

Mark only one oval.

- 8
- 11
- 13
- none of these

18. 10. The remainder when 62 is divided by -8 is

Mark only one oval.

- 2
- -2
- 0
- 6

19. 11.

Let a, b, c denote integers. Then $a \equiv b \pmod{m}$ implies

Mark only one oval.

$a^3 \equiv b^3 \pmod{m}$

Option 1

$a^{\frac{1}{3}} \equiv b^{\frac{1}{3}} \pmod{m}$

Option 2

$ac \equiv bc \pmod{m}$

Option 3

Both $a^3 \equiv b^3 \pmod{m}$ *and* $ac \equiv bc \pmod{m}$

Option 4

20. 12.

For the congruence $5x \equiv 1 (\mathrm{mod}\, 3)$, then the inverse of 5 modulo 3 is

Mark only one oval.

- 5
- 8
- 7
- 3

21. 13. If G is a tree with n vertices, then the number of edges of G are

Mark only one oval.

- n
- (n - 1)
- n(n + 1)
- n (n - 1)

22. 14. An edge whose two end vertices coincide is called

Mark only one oval.

- ring
- adjacent edge
- loop
- none

23. 15. A vertex whose degree 1 is called

Mark only one oval.

- isolated vertex
- even vertex
- pendant vertex
- none

24. 16. The maximum number of edges of a simple graph with 5 vertices and 2 components is

Mark only one oval.

- 2
- 7
- 5
- 6

25. 17. If the origin and terminus of a walk coincide then it is a

Mark only one oval.

- path
- open walk
- circuit
- closed walk

26. 18. The degree of the common vertex of two edges in series is

Mark only one oval.

- 0
- 1
- 2
- may be more than 2

27. 19. A simple graph has

Mark only one oval.

- no parallel edges
- no loops
- no isolated vertex
- no parallel edges and no loops

28. 20. A tree is a

Mark only one oval.

- any connected graph
- Euler graph
- minimally connected graph
- None

29. 21. A minimally connected graph cannot have a cycle

Mark only one oval.

- cycle
- component
- even vertex
- pendant vertex

30. 22. Sum of the degrees of all vertices of a binary tree is even if the tree has

Mark only one oval.

- even no of vertices
- four vertices
- odd no of vertices
- None of these

31. 23. Tree contains at least

Mark only one oval.

- one vertex
- two vertex
- three vertex
- None of these

32. 24. Dijkstra’s algorithm is used to

Mark only one oval.

- find maximum flow in a network
- to scan all vertices of a graph
- find the shortest path from a specified vertex to another
- None of these

33. 25. The minimum number of pendant vertices in a tree with five vertices is

Mark only one oval.

- 1
- 2
- 3
- 4

34. 26. Which of the following statement is true?

Mark only one oval.

- A spanning tree is a super graph of G
- A spanning tree may not be a tree at all
- A spanning tree is a subgraph of G
- G may not have a spanning tree

35. 27. A graph with no circuit and no parallel edges is called

Mark only one oval.

- Multi graph
- Pseudo graph
- Simple graph
- None of these

36. 28. A graph G has a spanning tree if G is

Mark only one oval.

- regular
- simple
- tree
- connected

37. 29. Minimum number of unique colors required for vertex coloring of a graph is called?

Mark only one oval.

- vertex matching
- chromatic index
- chromatic number
- color number

38. 30. How many unique colors will be required for proper vertex coloring of a line graph having n vertices?

Mark only one oval.

- 0
- 1
- 2
- n

39. 31. If F(x,y)=0 then

Mark only one oval.

- Always x dependent on y
- Always y dependent on x
- Always y and x are independent
- None of these

40. 32. The critical point of the function f(x,y)=xy is

Mark only one oval.

- (-1,1)
- (1,1)
- (1,-1)
- (0,0)

41. 33. The minimum value of the function (x+y)^4 + (x-c)^4 at (3,-3) is

Mark only one oval.

- c
- 2c
- 3c
- 0

42. 34.

If $z = x^2 + y^2$ then $d^2 z$ is

Mark only one oval.

≥ 0

- Option 1

< 0

- Option 2

≤ 0

- Option 3
- =0

43. 35.

$f(x, y) = x\sin y$ then $f_y(0, \pi) =$

Mark only one oval.

- 0
- π

  Option 2
- $-\pi$

  Option 3
- -1

44. 36. The area of the triangle whose vertices are (1,3), (0,0), (1,0) is

Mark only one oval.

- 8
- 3/2
- 0
- None of these

45. 37. The volume of the tetrahedron bounded by the plane x+y+z = 1 and co-ordinate planes is

Mark only one oval.

- 1/2
- 1/6
- 1/3
- 1

46. 38.

If $f(x,y)$ is continuous at (a,b) then $\lim_{(x,y)\to(a,b)} f(x,y) = ?$

Mark only one oval.

- 0
- 1
- Option 3: $f(a,b)$
- Option 4: $-f(a,b)$

47. 39.

If $f(x,y)$ and $g(x,y)$ are continuous at (a,b) then $\dfrac{f(x,y)}{g(x,y)}$ is always continuous at

Mark only one oval.

$(a,b), g(a,b) \neq 0$

Option 1

$(a,b), f(a,b) \neq 0$

Option 2

$(a,b), g(a,b) = 0$

Option 3

$(a,b), f(a,b) = 0$

Option 4

48. 40.

$\frac{\partial}{\partial x}(x^y) =$

Mark only one oval.

$x^y y$

Option 1

$x^y \log x$

Option 2

$x^{y-1} y$

Option 3

1

49. 41.

$$\lim_{(x,y)\to(0,0)} \frac{y}{x}$$

Mark only one oval.

∞

Option 1

1

0

limit does not exists

50. 42.

$f(x,y) = x^{\frac{3}{2}} e^{y}$ then $f_x(1,2) =$

Mark only one oval.

$\frac{2}{3}e^{2}$

Option 1

$-\frac{2}{3}e^{2}$

Option 2

$-\frac{2}{3}e^{\frac{1}{3}}$

Option 3

$\frac{3}{2}e^{2}$

Option 4

51. 43.

If $f(x, y) = \dfrac{x}{\sin y}$; then the number of points of discontinuity of f is

Mark only one oval.

- 0
- 1
- finite but more than 1
- infinite

52. 44.

The domain of the function $f(x, y) = \frac{x}{\sin y}$ is

Mark only one oval.

$R^2 \times R^2$

Option 1

$R \times R$

Option 2

$R \times (R \setminus \{n\pi : n \in Z\})$

Option 3

None of these

53. 45.

The double integral $\iint_R dxdy$ represents

Mark only one oval.

- area of a region R
- volume bounded by any surface and the above a region R in xy-plane
- the area of a region R in xy plane
- None of these

54. 46.

The value of $\int_0^2 \int_0^{x^2} \left(\left(\int_0^y dz \right) dy \right) dx$ is

Mark only one oval.

- 8/5
- 32/5
- 16/5
- 4/5

55. 47.

The value of $\int_0^{\frac{\pi}{2}}\int_0^2 r\,dr\,d\theta$ is

Mark only one oval.

2π

Option 1

π

Option 2

3π

Option 3

0

56. 48.

The value of $\int_0^{\frac{\pi}{2}} \int_0^{\pi} \sin(x+y)\,dx\,dy$ is

Mark only one oval.

- 2
- 5
- 10
- None of these

57. 49.

The value of $\int_0^1 \int_0^{\sqrt{1-x^2}} y^2 \, dx \, dy$ is

Mark only one oval.

$\frac{\pi}{16}$

Option 1

$\frac{\pi}{8}$

Option 2

$\frac{\pi}{4}$

Option 3

$\frac{\pi}{2}$

Option 4

58. 50.

The value of $\int_2^4 \int_1^3 \int_9^{10} dxdydz$is

Mark only one oval.

- 4
- 5
- 2
- None of these

59. 51.

The value of $\int_0^2 \int_0^x \int_0^{x+y} e^x(y+2z)dxdydz$ is

Mark only one oval.

$19(\frac{e^2}{3} + 1)$

- Option 1
- 25
- 28
- e

60. 52.

The value of the triple integral $\iiint_E dxdydz$, E = [0,1; 0,2; 0,3] is

Mark only one oval.

8π

Option 1

π

Option 2

4π

Option 3

6

61. 53.

Find the value of $\iint \frac{x}{x^2+y^2}\,dxdy$.

Mark only one oval.

$y\tan^{-1}y-\frac{1}{2}\log\left(1+y^2\right)$

Option 1

$y[x\tan^{-1}x-\frac{1}{2}\log\left(1+x^2\right)]$

Option 2

$x[y\tan^{-1}y-\frac{1}{2}\log\left(1+y^2\right)]$

Option 3

$x[y\tan^{-1}y-\frac{1}{2}\log\left(1+y^2\right)]$

Option 4

62. 54.

Evaluate $\iint [x^2 + y^2 - a^2]dxdy$ where, x and y varies from –a to a.

Mark only one oval.

$-\frac{2}{3}a^4$

Option 1

$-\frac{4}{3}a^4$

Option 2

$-\frac{4}{3}a^5$

Option 3

$-\frac{2}{3}a^5$

Option 4

63. 55.

If double integral in Cartesian coordinate is given by $\iint_R f(x, y)\ dx\ dy$ then the value of same integral in polar form is _____

Mark only one oval.

$\iint_R f(r\cos\theta, r\sin\theta)\, r\,dr\, d\theta$

Option 1

$\iint_R f(r\cos 2\theta, r\sin 2\theta)\, r\,dr\, d\theta$

Option 2

$\iint_R f(r\cos 4\theta, r\sin 4\theta)\, r^2\,dr\, d\theta$

Option 3

$\iint_R f(r\sin 3\theta, r\cos 3\theta)\,dr\, d\theta$

Option 4

64. 56.

$$\int_0^1 \int_0^y e^{\frac{y}{x}} dy dx =$$

Mark only one oval.

$$\frac{e+1}{2}$$

Option 1

$$\frac{e-1}{2}$$

Option 2

e

None of these

65. 57.

The integrating factor of $ydx - xdy + 4x^3y^2e^{x^4}dx = 0$ is

Mark only one oval.

$\frac{1}{y}$

Option 1

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

Option 2

xy^2

Option 3

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

Option 4

66. 58.

The general solution of $\left(\frac{dy}{dx}\right)^2 + \frac{dy}{dx} - 6 = 0$ is

Mark only one oval.

$(y+3x-c)(y-2x-c)=0$

- Option 1

$(y+3x-c_1)(y-2x-c_2)=0$

- Option 2

$(y+3x)(y-2x-c)=0$

- Option 3
- None of these

67. 59.

$$\frac{1}{\left(D^2-2D+2\right)}\cos x=$$

Mark only one oval.

$$\frac{1}{5}\left(-2\sin x+\cos x\right)$$

Option 1

$$\frac{1}{10}\cos x$$

Option 2

$$\frac{1}{5}\left(2\sin x+\cos x\right)$$

Option 3

None of these

68. 60.

The CF of the equation $x^2\frac{d^2y}{dx^2}-2x\frac{dy}{dx}=3x$ is

Mark only one oval.

$c_1x+c_2e^{3x}$

Option 1

$c_1e^x+c_2e^{3x}$

Option 2

$c_1+c_2e^{3x}$

Option 3

None of these

69. 61.

$(D^4 - 2D^2 + 1)y = 0$

Mark only one oval.

$(D^4 - 2D^2 + 1)y = 0$

Option 1

$(D^4 - D^2 + 1)y = 0$

Option 2

$(D^3 - D + 1)y = 0$

Option 3

None of these

70. 62.

A particular solution of $\frac{d^2y}{dx^2} + y = 0$ when x=0, y=4; $x = \frac{\pi}{2}$, y=0 is

Mark only one oval.

$y = A\cos x$

Option 1

$y = 4\cos x + 2\sin x$

Option 2

$y = 5\cos x$

Option 3

$y = 4\cos x$

Option 4

71. 63.

$$\frac{1}{D^2+4}\sin 2x=$$

Mark only one oval.

$$\frac{\cos 2x}{2}$$

Option 1

$$\frac{1}{4}x\cos 2x$$

Option 2

$$-\frac{1}{4}x\cos 2x$$

Option 3

None of these

72. 64.

The particular integral of $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 4 = e^x \cos x$ is

Mark only one oval.

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

- Option 1

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

- Option 2
- e^xcosx
- None of these

73. 65.

The Wronskian for the differential equation $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = 9e^x$ is

Mark only one oval.

e^{2x}

Option 1

e^x

Option 2

e^{3x}

Option 3

None of these

74. 66.

The P.I. of the equation $2x\frac{d^2y}{dx^2}+2\frac{dy}{dx}=\frac{1}{x}$ is

Mark only one oval.

$\frac{1}{4}x^2$

Option 1

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

Option 2

$\frac{1}{2}(\log x)^2$

Option 3

$\frac{1}{4}(\log x)^2$

Option 4

75. 67.

The solution of the system $Dx = y$, $Dy = x \left(D \equiv \frac{d}{dt} \right)$ is

Mark only one oval.

$x = Ae^{t} + Be^{-t}$, $y = Ae^{t} + 2Be^{-t}$

Option 1

$y = Ae^{t} + Be^{-t}$ $x = Ae^{t} - Be^{-t}$

Option 2

$x = Ae^{t} + Be^{-t}$, $y = -Ae^{t} - Be^{-t}$

Option 3

None of these

76. 68. For a given differential equation, if C.F.=c1 cos2x+c2sin2x , then the Wronskian is

Mark only one oval.

- 1
- 2
- cos2x
- sin2x

77. 69. The remainder when 3^10 is divided by 7 is

Mark only one oval.

- 0
- 1
- 7
- 4

78. 70. The minimum value of the function (x+y)^4 + (x-c)^4 at (3,-3) is

Mark only one oval.

- c
- 2c
- 3c
- 0
