

Roll. No.

Question Booklet Number

O.M.R. Serial No.

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404578

BCA (SEM.-IV) (NEP) EXAMINATION, 2024
COMPUTER APPLICATION
(Mathematics-III)

[BCA-4005]

Paper Code							
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Question Booklet
Series

B

Time : 1 : 30 Hours

Max. Marks : 75

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer 75 questions in the OMR Answer-Sheet provided and not in the question booklet. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.
4. Four alternative answers are mentioned for each question as - A, B, C & D in the booklet. The candidate has to choose the correct / answer and mark the same in the OMR Answer-Sheet as per the direction :

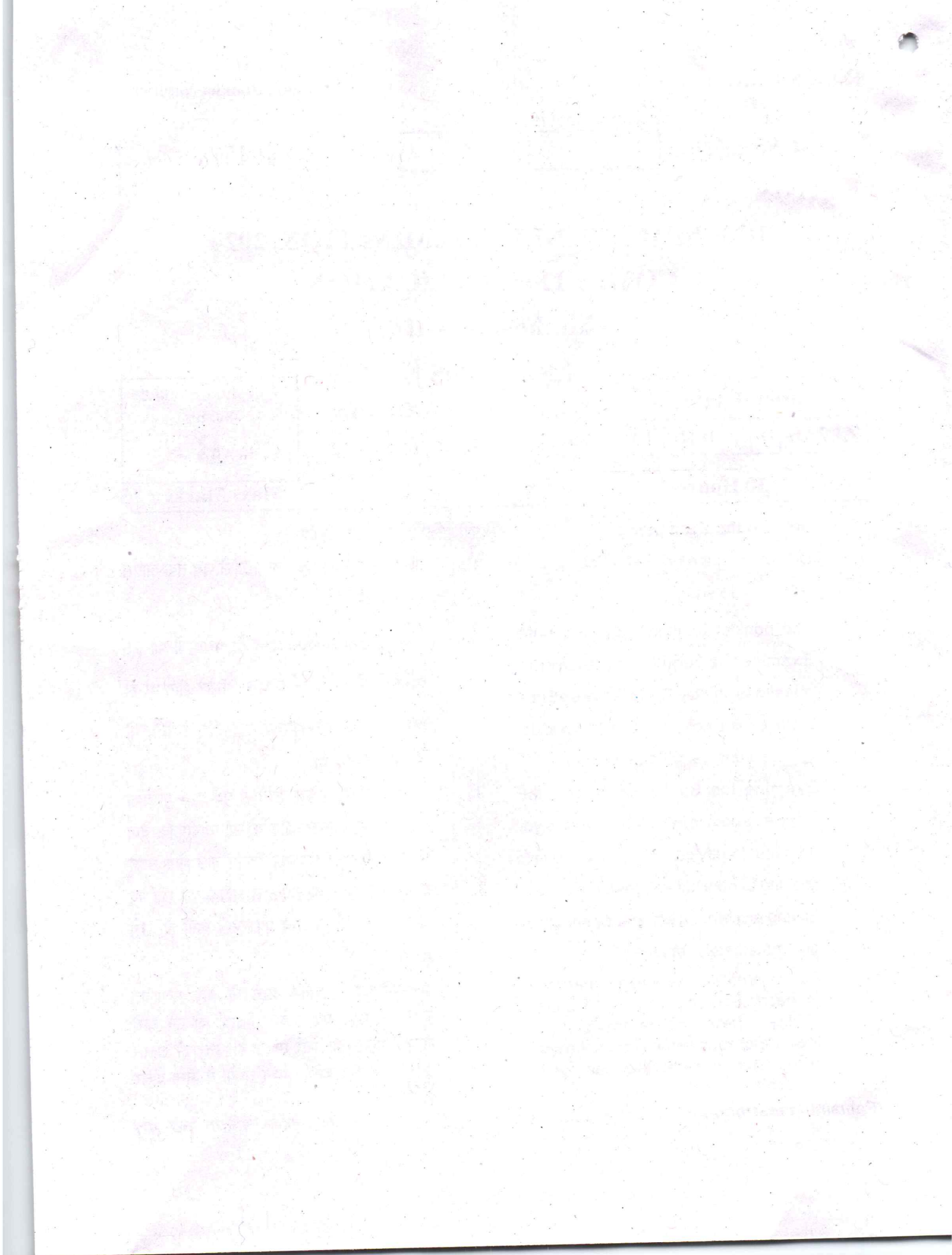
(Remaining instructions on last page)

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आप कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, उसे तुरन्त बदल लें।
4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर- A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से सही उत्तर छोटना है। उत्तर को OMR उत्तर-पत्रक में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

(शेष निर्देश अन्तिम पृष्ठ पर)

SE



1. Surfaces $\phi_1(x, y, z) = C_1$ and $\phi_2(x, y, z) = C_2$ are orthogonal if:

- (A) $\phi_1 \cdot \phi_2 = 0$
 (B) $\nabla \cdot (\phi_1 + \phi_2) = 0$
 (C) $\nabla \phi_1 \cdot \nabla \phi_2 = 0$
 (D) $\nabla \phi_1 \times \nabla \phi_2 = 0$

2. Gradient of a scalar function $\phi(x, y, z)$ is :

- (A) $\frac{\partial \phi}{\partial x} + \frac{\partial \phi}{\partial y} + \frac{\partial \phi}{\partial z}$
 (B) $\frac{\partial \phi}{\partial x} \hat{i} + \frac{\partial \phi}{\partial y} \hat{j} + \frac{\partial \phi}{\partial z} \hat{k}$
 (C) $\frac{\partial^2 \phi}{\partial x^2} + \frac{\partial^2 \phi}{\partial y^2} + \frac{\partial^2 \phi}{\partial z^2}$
 (D) None of the above

3. Let $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ and $r = |\vec{r}|$, then :

- (A) $\nabla e^r = \frac{e^r}{r}$
 (B) $\nabla e^r = e^r \vec{r}$
 (C) $\nabla e^r = \frac{e^r}{r} \vec{r}$
 (D) $\nabla e^r = e^{-r} r \vec{r}$

4. Divergence of vector field $F = (x^2y, y^2, z^2x)$ at a point $(-1, 2, 3)$ is :

- (A) -5
 (B) 10

(C) 14

(D) -6

5. For the scalar function f , $\text{div}[\text{grad } f]$ is equal to :

- (A) $\frac{\partial f}{\partial x} \hat{i} + \frac{\partial f}{\partial y} \hat{j} + \frac{\partial f}{\partial z} \hat{k}$
 (B) 0
 (C) $\frac{\partial^2 f}{\partial x^2} + \frac{\partial^2 f}{\partial y^2} + \frac{\partial^2 f}{\partial z^2}$
 (D) None of the above

6. If $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$, then $\nabla \cdot \vec{r} =$

- (A) 0
 (B) 3
 (C) -3
 (D) 1

7. If

$$\vec{F} = (x+3y)\hat{i} + (y-2z)\hat{j} + (x+mz)\hat{k}$$

is solenoidal, then the value of m is :

- (A) 2
 (B) 3
 (C) -2
 (D) 0

8. The curl of a vector function

$$\vec{F} = x^2\hat{i} + 2z\hat{j} - y\hat{k} \text{ is :}$$

- (A) $-3\hat{k}$
 (B) $-3\hat{i}$
 (C) 0
 (D) $-3\hat{j}$

9. If $\frac{dy}{dx} = \frac{x+y+1}{x+y-1}$, then it is reduced to

homogeneous by :

- (A) $x+y=v+1$
(B) $x+y=v$
(C) $x-y=v$
(D) $x+y+1=v$
10. $\frac{dx}{dy} + xy = y^2$ is :
(A) linear in x
(B) linear in y
(C) non-linear in x
(D) none of the above
11. If $z_1 = x_1 + iy_1, z_2 = x_2 + iy_2$, then real part of $z_1 z_2$ is :
(A) $x_1 y_2 + x_2 y_1$
(B) $x_1 y_1 + x_2 y_2$
(C) $x_1 x_2 - y_1 y_2$
(D) $x_1 x_2 + y_1 y_2$
12. Arg (z) at $z=0$ is :
(A) 0
(B) not defined
(C) $\frac{\pi}{2}$
(D) $\frac{-\pi}{2}$
13. If $z=1-i$, then conjugate of conjugate of z is :
(A) $1+i$
(B) $1-i$

(C) $-1+i$

(D) $-1-i$

14. If $z = x + iy$, then $z + \bar{z}$ is equal to :

(A) x

(B) $2x$

(C) $2y$

(D) $2x + i2y$

15. If $z = 2 + 3i$, then modulus of z is :

(A) 13

(B) 5

(C) $\sqrt{13}$

(D) 15

16. Imaginary part of $\frac{z_1}{z_2}$ is, where

$z_1 = x_1 + iy_1, z_2 = x_2 + iy_2$:

(A) $\frac{x_2 y_1 - x_1 y_2}{x_2^2 + y_2^2}$

(B) $\frac{x_2 y_1 - x_1 y_2}{x_1^2 + y_1^2}$

(C) $\frac{x_2 y_1 - x_1 y_2}{x_1^2 + y_2^2}$

(D) $\frac{x_2 y_1 - x_1 y_2}{x_1^2 + x_2^2}$

17. If $x + iy = \frac{2-3i}{4+7i}$, then :

(A) $x = \frac{1}{5}, y = \frac{-2}{5}$

(B) $x = \frac{-1}{5}, y = \frac{2}{5}$

(C) $x = \frac{-1}{5}, y = \frac{-2}{5}$

(D) $x = \frac{1}{5}, y = \frac{2}{5}$

18. The differential equation

$$\frac{2dy}{dx} + x^2y = 2x + 3 \text{ is :}$$

- (A) linear
- (B) non-linear
- (C) linear with constant coefficients
- (D) none of the above

19. A differential equation is ordinary if it has :

- (A) one dependent variable
- (B) one independent variable
- (C) both (A) and (B)
- (D) none of the above

20. Differential equation $Mdx + Ndy$ is exact iff :

- (A) $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$
- (B) $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$
- (C) $\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$
- (D) $\frac{\partial M}{\partial x} \neq \frac{\partial N}{\partial y}$

21. Fourier series uses which domain representation of signals ?

- (A) Time domain
- (B) Frequency domain
- (C) Both (A) and (B)
- (D) None of the above

22. General solution of $(x^2 + 1)\frac{dy}{dx} = y$ is :

- (A) $y = \frac{x^3}{3} + x + c$
- (B) $y = c(x^2 + 1)$
- (C) $y = ce^{x^2+1}$
- (D) $y = ce^{\tan^{-1}x}$

23. Integrating factor of $\frac{dy}{dx} + Py = Q$ is :

- (A) $\int_e^{Pdy}$
- (B) $\int_e^{Pdx}$
- (C) $\int e^P dx$
- (D) None of the above

24. $(y - \cos x) + (x + \sin y)\frac{dy}{dx} = 0$ is :

- (A) exact ODE
- (B) not exact ODE
- (C) linear in y
- (D) linear in x

25. Directional derivative of f in the direction of unit vector $\hat{u}$ is :

- (A) $\nabla f \cdot \vec{u}$
- (B) $\nabla f \hat{u}$
- (C) $\nabla f \cdot \hat{u}$
- (D) None of the above

26. Solution of $\frac{dy}{dx} = \frac{x}{y}$ is :

- (A) $y^2 = x^2 + y$
- (B) $y = x^3$
- (C) $y^2 = x^2 + c$
- (D) $y = e^x$

27. If $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$, then its solution is :

- (A) $\tan^{-1} y = \tan^{-1} x + c$
- (B) $\tan^{-1} y = 2$
- (C) $y = 1 + x^2$
- (D) $1 + y^2 = 1 + x^2 + c$

28. If $f(x, y) = x^3 + y^3 + 2$, then $f(x, y)$ is :

- (A) homogeneous f^n of degree 3
- (B) homogeneous f^n of degree 0
- (C) non-homogeneous of degree 2
- (D) non-homogeneous f^n

29. $\frac{dy}{dx} + Py = Qy^n$ is linear if :

- (A) $n = 2$
- (B) $n = 1$
- (C) $n = 0$
- (D) $n = 0, 1$

30. For equation $\frac{dv}{dx} + \frac{2}{x+1}v = x^3$, integrating factor is :

- (A) $x+1$
- (B) $(x+1)^2$

(C) $(x+1)^3$

(D) $(x+1)^4$

31. $(1-x^2)\frac{dy}{dx} + xy = xy^2$

can be transformed to linear by rule :

(A) $\frac{1}{y^2} = v$

(B) $\frac{1}{y} = v$

(C) $y^2 = v$

(D) $y = v$

32. $\frac{dy}{dx} = \frac{x+2y+3}{2x+3y+4}$ is reducible to homogeneous if :

(A) $x = X+1, y = Y+2$

(B) $x = X-1, y = Y-2$

(C) $x = X+1, y = Y-2$

(D) None of the above

33. Integrating factor of $\frac{dv}{dx} + 2xv = x^3$ is :

(A) e^x

(B) x^3

(C) e^{x^2}

(D) x^2

34. A vector field is irrotational if :

(A) $\nabla \times \vec{F} = 0$

(B) $\nabla \cdot \vec{F} = 0$

(C) $\nabla^2 \vec{F} = 0$

(D) None of the above

35. If $\vec{F} = yz\hat{i} + zx\hat{j} + xy\hat{k}$ and $\vec{F} = \nabla\phi$ then ϕ is :

(A) $x + y + z + c$

(B) $x^2 + y^2 + z^2 + c$

(C) $xyz + c$

(D) $x^2 + y + z + c$

36. Conjugate of the complex number

$(6+5i)^2$ is :

(A) $10 + 60i$

(B) $11 - 60i$

(C) $11 + 60i$

(D) $6 - 5i$

37. Value of $\frac{(1+i)^{20}}{(1-i)^{20}}$ is :

(A) -1

(B) $-i$

(C) i

(D) 1

38. Value of $(i)^{19}$ is equal to :

(A) -1

(B) $-i$

(C) i

(D) 1

39. Find the particular integral of $(D^2 - 4)y = 1$:

(A) $-\frac{1}{6}$

(B) $-\frac{1}{5}$

(C) $-\frac{1}{4}$

(D) $\frac{1}{4}$

40. Find the P.I. of $(D^2 + 4)y = \cos 2x$:

(A) $\frac{x}{4} \sin 2x$

(B) $\frac{x}{4} \cos 2x$

(C) $\frac{x}{2} \sin 2x$

(D) $x \sin 2x$

41. Particular integral of $(D^2 - 1)y = x$ is :

(A) x

(B) x^2

(C) $-x$

(D) -1

42. Solution of $(D^2 + 1)y = 0$ is :

(A) $c_1 e^x + c_2 e^{-x}$

(B) $c_1 \cos x + c_2 \sin x$

(C) $c_1 \cos x - c_2 \sin x$

(D) Both (B) and (C)

43. If $f(x)$ is discontinuous at $x=l$ in $[a,b]$ then $f(l)$ is :

- (A) $\frac{\lim_{h \rightarrow 0} f(l-h) + \lim_{h \rightarrow 0} f(l+h)}{2}$
 (B) $\lim_{h \rightarrow 0} f(l+h)$
 (C) $\lim_{h \rightarrow 0} f(x)$
 (D) None of the above

44. $\frac{dy}{dx} = x$, then general solution is :

- (A) $y = \frac{x^2}{2}$
 (B) $y = \frac{x^2}{2} + c$
 (C) $y = x^2 + c$
 (D) $y = \left(\frac{x}{2}\right)^2 + c$

45. If $y = ce^x$, then corresponding differential equation is :

- (A) $\frac{dy}{dx} = y$
 (B) $\frac{dy}{dx} = cy$
 (C) $\frac{dx}{dy} = y$
 (D) $\frac{dx}{dy} = cy$

46. Which of the following is ODE ?

- (A) $y = dx$
 (B) $dy = dx$

(C) $x = y$

(D) $y = x^2$

47. Order of differential equation

$\frac{d^2y}{dx^2} + y^2 = 0$ is :

- (A) 2
 (B) 1
 (C) not defined
 (D) None of the above

48. $\frac{dy}{dx} + y = y^2$ is :

- (A) linear ODE
 (B) non-linear ODE
 (C) homogeneous ODE
 (D) linear PDE

49. Degree of ODE

$\frac{d^2y}{dx^2} + \sqrt{1 + \left(\frac{dy}{dx}\right)^3} = 0$ is :

- (A) 2
 (B) 3
 (C) $\frac{1}{2}$
 (D) 1

50. If $\frac{dy}{dx} = \cot x$, then it is linear in variable :

- (A) x only
 (B) both x and y
 (C) y only
 (D) none of the above

51. If $|z|=4$ and $\arg(z)=\frac{5\pi}{6}$, then z

is :

- (A) $2\sqrt{3}-2i$
- (B) $2\sqrt{3}+2i$
- (C) $-2\sqrt{3}+2i$
- (D) None of the above

52. Operator form of $\frac{d^3y}{dx^3}+\frac{dy}{dx}+y=0$

is :

- (A) $D^3+D+1=0$
- (B) $(D^3+D+1)y=0$
- (C) $D^3+D+y=0$
- (D) None of the above

53. If $z_1=1+i, z_2=1-i$, then z_1z_2 is :

- (A) 1
- (B) $1-i$
- (C) i
- (D) 2

54. Euler's formula for b_n in Fourier series in $[a,b]$ is :

- (A) $\int_a^b f(n)\cos nx dx$
- (B) $\int_a^b f(n)\sin nx dx$

(C) $\int_a^b f(n) dx$

(D) $\frac{2}{b-a} \int_a^b f(n) \sin\left(\frac{2n\pi x}{b-a}\right) dx$

55. If $f(n)$ is periodic in $-l < x < l$, then Fourier coefficient a_0 is :

(A) $\frac{1}{2l} \int_{-l}^l f(n) dx$

(B) $\frac{1}{l} \int_{-l}^l f(n) dx$

(C) $\int_{-l}^l f(n) dx$

(D) None of the above

56. $\frac{dy}{dx}=x+y$, then integrating factor

is :

(A) e^x

(B) e^y

(C) e^{-x}

(D) e^{-y}

57. If $z=-2+3i$, then principal argument is :

(A) $\pi - \tan^{-1}\left|\frac{3}{2}\right|$

(B) π

(C) $\frac{\pi}{2}$

(D) $\tan^{-1}\left(\frac{3}{2}\right)$

58. If $\vec{F} = x^2 yz \hat{i} + xy^2 z \hat{j} + xyz^2 \hat{k}$, then $\text{div } \vec{F}$ at $(1, 2, 3)$ is :
- (A) -12
(B) 6
(C) 12
(D) 15
59. Function $f(x) = \cos x$ is periodic with period :
- (A) π
(B) 2π
(C) 4π
(D) 6π
60. In the expansion of Fourier series of $f(x)$ in $[a, b]$ a_0 is :
- (A) $a_0 = \frac{1}{b-a} \int_a^b f(x) dx$
(B) $a_0 = \frac{1}{b} \int_a^b f(x) dx$
(C) $a_0 = \frac{1}{a} \int_a^b f(x) dx$
(D) $a_0 = \frac{1}{a-b} \int_a^b f(x) dx$
61. If $f(n) = x, 0 < x < 2\pi$ then Fourier coefficient a_n is equal to :
- (A) 2π
(B) 0
(C) π
(D) $\frac{-2}{n}$
62. If $f(n) = x^2, -\pi < x < \pi$, then Euler formula gives :
- (A) $a_n = 0$
(B) $a_n = 2$
(C) $b_n = 0$
(D) $b_n = 2$
63. If $f(x)$ is periodic in interval $[-\pi, \pi]$ then time period w is equal to :
- (A) π
(B) $-\pi$
(C) 2π
(D) None of the above
64. If $f(n) = x^3, -\pi < x < \pi$ then constant term a_0 is equal to :
- (A) $2(-1)^n$
(B) 0
(C) 2
(D) $(-1)^n$
65. If $f(t) = \begin{cases} 0, & -5 < t < 0 \\ 3, & 0 < t < 5 \end{cases}$ is periodic then time period T is :
- (A) 0
(B) 5
(C) $-5 < t < 5$
(D) 10

66. Normal vector to the surface $\phi(x, y, z) = c$ is :
 (A) $\nabla \cdot \phi$
 (B) $\nabla \phi$
 (C) $\nabla \times \phi$
 (D) None of the above
67. Greatest rate of increase of ϕ is :
 (A) $\text{grad } \phi$
 (B) $\text{curl } \phi$
 (C) $\text{div } \phi$
 (D) None of the above
68. If $\vec{a} = i + j + k$, then unit vector $\hat{a}$ is :
 (A) $\frac{i + j + k}{3}$
 (B) $\frac{i + j + k}{\sqrt{3}}$
 (C) $i + j + k$
 (D) None of the above
69. If $f(x)$ is odd function, then Fourier coefficient a_n is :
 (A) $a_n = 0$ for all intervals
 (B) $a_n = 0$ in $-\pi < x < \pi$
 (C) $b_n = 0$ in $-\pi < x < \pi$
 (D) None of the above
70. If $\vec{v} = (x - y)\hat{i} + (x + y)\hat{j} + z\hat{k}$, then $\text{curl } \vec{v}$ is equal to :
 (A) $2\hat{i}$
 (B) $2\hat{j}$
 (C) $2\hat{k}$
 (D) $\hat{k}$
71. Given differential equation $\frac{d^2 y}{dx^2} - y = 0$ has solution as :
 (A) $c_1 \cos x + c_2 \sin x$
 (B) $c_1 e^{2x} + e^{-x}$
 (C) $c_1 e^x + c_2 e^{-x}$
 (D) $(c_1 + c_2 x)e^x$
72. Solution of ODE $\frac{dy}{dx} = xy$ is :
 (A) $y = x + c$
 (B) $\log y = \frac{x^2}{2} + c$
 (C) $\log y = x^2$
 (D) $y = e^{x^2} + c$
73. If $\vec{F}$ is conservative field then :
 (A) $\text{curl } \vec{F} = 0$
 (B) $\text{div } \vec{F} = 0$
 (C) $\text{grad } \vec{F} = 0$
 (D) None of the above
74. Multiplicative inverse of complex number $z = 1 + i$ is :
 (A) 0
 (B) $1 + i$
 (C) $\frac{1 - i}{2}$
 (D) None of the above

75. Region defined by $|z| \geq 1$ is :

- (A) $x^2 + y^2 \geq 1$
- (B) $x^2 - y^2 \geq 1$
- (C) $z \geq 1$
- (D) $x + iy \geq 1$

76. Vector normal to the surface $f(x, y, z) = c$ is :

- (A) ∇f
- (B) $\nabla^2 f$
- (C) $\nabla \cdot f$
- (D) $\nabla \times f$

77. If $\phi(x, y, z)$ is constant then gradient of ϕ is :

- (A) constant
- (B) 0
- (C) can not be 0
- (D) None of the above

78. Greatest rate of increase of $\phi = xyz^2$ at point $(1, 0, 3)$ is :

- (A) $\sqrt{9}$
- (B) $9\hat{j}$
- (C) $9\hat{i}$
- (D) 9

79. Vector field $\vec{F}$ is solenoidal if :

- (A) divergence of $\vec{F} \neq 0$
- (B) divergence of $\vec{F} = 0$
- (C) curl $\vec{F} = 0$
- (D) curl $\vec{F} \neq 0$

80. Which of the following is not true ?

- (A) $\text{div}(A+B) = \text{div}(A) + \text{div}(B)$
- (B) $\text{Grad}(\text{constant}) = 0$
- (C) $\nabla \cdot (A+B) = \nabla \cdot A + \nabla \cdot B$
- (D) Divergence $(\hat{i} + \hat{j}) = 2$

81. $\text{grad} \left(\frac{1}{r} \right)$ is equal to :

- (A) 0
- (B) $\frac{1}{r^2}$
- (C) $-\frac{1}{r}$
- (D) None of the above

82. If $r^n \vec{r}$ is solenoidal, then :

- (A) $n = 3$
- (B) $n = -3$
- (C) $n = 2$
- (D) $n = -2$

83. Curl of $\vec{a} \times \vec{r}$ is :

- (A) 0
- (B) $\vec{a}$
- (C) $\vec{r}$
- (D) $2\vec{a}$

84. If $r = \sqrt{x^2 + y^2 + z^2}$, then :

- (A) $\nabla r^2 = 2\vec{r}$
- (B) $\nabla r^2 = 2r$
- (C) $\nabla r^2 = 2r \nabla r$
- (D) None of the above

85. Polar form of $z = -1 + \sqrt{3}i$ is :

(A) $z = 2 \left[\cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3} \right]$

(B) $z = 4 \left[\cos \frac{\pi}{3} + i \sin \frac{\pi}{3} \right]$

(C) $z = 2 \left[\cos \frac{\pi}{3} + i \sin \frac{\pi}{3} \right]$

(D) $z = 2e^{\frac{2\pi}{3}}$

86. Find the real number B if

$$A + iB = \frac{3 - 2i}{7 + 4i} :$$

(A) $B = \frac{2}{5}$

(B) $B = \frac{-2}{5}$

(C) $B = \frac{1}{5}$

(D) $B = \frac{-1}{5}$

87. If $z = -1 - \sqrt{3}i$, then $|z|$ is :

(A) 4

(B) 2

(C) $\frac{\pi}{3}$

(D) $\frac{\pi}{6}$

88. Argument of $z = \frac{1 + 7i}{(2 - i)^2}$ is :

(A) 2π

(B) $\frac{3\pi}{2}$

(C) $\frac{3\pi}{4}$

(D) None of the above

89. If $\vec{r} = xi + yj + zk$, then ∇r is :

(A) $\vec{r}$

(B) r

(C) $\frac{\vec{r}}{r}$

(D) $2r$

90. $\nabla \left[\frac{f}{g} \right]$ is equal to :

(A) $\frac{g\nabla f - f\nabla g}{g^2}, g \neq 0$

(B) $\frac{g\nabla f + f\nabla g}{g^2}, g \neq 0$

(C) $\frac{\nabla g}{\nabla f}$

(D) $\frac{\nabla f}{\nabla g}$

91. If $\vec{r} = xi + yj + zk$, then ∇r^n is :

(A) nr^{n-1}

(B) $nr^{n-2}\vec{r}$

(C) $nr^{n-1}\vec{r}$

(D) nr^{n-2}

92. The locus of the points z satisfying the condition $\arg \left(\frac{z-1}{z+1} \right) = \frac{\pi}{3}$ is a :
- (A) Parabola
(B) Circle
(C) Pair of straight lines
(D) None of the above
93. If $z = re^{i\theta}$ then $|e^{iz}|$ is equal to :
- (A) $e^{-r \sin \theta}$
(B) $re^{-r \sin \theta}$
(C) $e^{-r \cos \theta}$
(D) $re^{-r \cos \theta}$
94. If cube roots of unity are $1, w, w^2$ then :
- (A) $1 + w + w^2 = 2$
(B) $1 + w + w^2 = 0$
(C) $w^3 = -1$
(D) $w^2 = 1$
95. Let $z = i$, then $\arg z$ is equal to :
- (A) $-\frac{\pi}{2}$
(B) π
(C) $\frac{\pi}{2}$
(D) $-\pi$
96. Which of the following is true ?
- (A) $|z_1 z_2| \geq |z_1| |z_2|$
(B) $|z_1 + z_2| \leq |z_1| - |z_2|$
(C) $|z_1 - z_2| = |z_1| - |z_2|$
(D) $|z_1 + z_2| \leq |z_1| + |z_2|$
97. Modulus of $z = x + iy$ is :
- (A) $x^2 + y^2$
(B) $\sqrt{x^2 + y^2}$
(C) $x + y$
(D) $x - iy$
98. Real part of $z = \frac{a+ib}{c+id}$ is :
- (A) $\frac{ac+bd}{a^2+b^2}$
(B) $\frac{ac+bd}{c^2+a^2}$
(C) $\frac{ac+bd}{a^2+d^2}$
(D) $\frac{ac+bd}{c^2+d^2}$
99. Modulus amplitude form of $z = x + iy$ is :
- (A) re^θ
(B) $re^{i\theta}$
(C) $e^{i\theta}$
(D) r
100. Argument of $z = 1 - i$ is :
- (A) $\frac{\pi}{2}$
(B) $\frac{\pi}{4}$
(C) $\frac{-\pi}{4}$
(D) $\frac{-\pi}{2}$

Rough Work / रफ कार्य

Example :

Question :

Q.1 (A) ● (C) (D)

Q.2 (A) (B) ● (D)

Q.3 (A) ● (C) (D)

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
6. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.
7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.

After the completion of the examination, candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.
9. There will be no negative marking.
10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
11. To bring and use of log-book, calculator, pager & cellular phone in examination hall is prohibited.
12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ● (C) (D)

प्रश्न 2 (A) (B) ● (D)

प्रश्न 3 (A) ● (C) (D)

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
6. सभी उत्तर केवल ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
7. ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।
9. निगेटिव मार्किंग नहीं है।
10. कोई भी रफ कार्य, प्रश्न-पुस्तिका में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
11. परीक्षा-कक्ष में लॉग-बुक, कैल्कुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण: प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।