QP-RA(IF)-2024

Question Booklet No.

Test Booklet
Series

A

PAPER—II

Time Allowed : 2 Hours

Maximum Marks : 100

INSTRUCTIONS FOR CANDIDATES

1. Immediately after the commencement of the examination, you should check that this Test Booklet **does not** have any unprinted or torn or missing pages or questions etc. If so, get it replaced by a complete Test Booklet.

2. Write your Roll Number on the Test Booklet in the Box provided alongside.

3. This Test Booklet contains **100** questions. Each question comprises of four responses (answers) within as (A), (B), (C) and (D). You should select the response which you feel is the most **correct** and mark it on the OMR Answer Sheet.

4. You have to mark all your responses **ONLY** on the separate **OMR Answer Sheet** provided. Also read the directions in the **OMR Answer Sheet**. Fill in all the entries in the OMR Answer Sheet **correctly**. **DO NOT WRITE/MARK ANYTHING EXCEPT IN THE SPACE PROVIDED FOR IT,** failing which your OMR Answer Sheet **shall not** be evaluated.

5. **Count** the number of **questions attempted** carefully and write it down in the space provided **in the OMR Answer Sheet**.

6. After you have completed filling in all your responses on the **OMR Answer Sheet** and the examination has concluded, **you should hand over** to the Invigilator **only the OMR Answer Sheet (in original)**. **You are permitted to take away 2nd Copy of the OMR Answer Sheet and Test Booklet**.

7. Each question carries 1 mark.

8. Candidature would be cancelled in case of non-compliance with any of these instructions.

9. There will be no penalty for wrong answers.

10. **"Mobile phones, calculators, IT gadgets, smart watch and any other electronic devices such as Bluetooth etc. are not allowed inside the premises where the examination is being conducted. Any infringements of these instructions shall entail disciplinary action including ban from future examinations."**

/84-**A**

SEAL

1. In an economy, the value of indirect taxes is ₹ 200 crores and the value of net indirect taxes is (–) ₹ 250 crores. Identify the value of subsidies.

   (A) ₹ 50 crores

   (B) ₹ 450 crores

   (C) (–) ₹ 450 crores

   (D) ₹ 250 crores

2. A car purchased by a household is a

   (A) single use capital good

   (B) single use consumer good

   (C) durable consumer good

   (D) semi-durable consumer good

3. Which of the following is **not** a quantitative method of credit control?

   (A) Open Market Operation

   (B) Margin Requirements

   (C) Variable Reserve Ratio

   (D) Bank Rate Policy

4. Excess demand in an economy may give birth to

   (A) deflationary gap

   (B) inflationary gap

   (C) low-level of employment

   (D) excess capacity

5. Desired consumption during an accounting year is called as

   (A) ex-ante consumption

   (B) ex-post consumption

   (C) autonomous consumption

   (D) None of the above

6. If MPC is 0·5, then the value of investment multiplier equals to

   (A) 4

   (B) 2

   (C) 1

   (D) 0·2

7. Sex ratio in India as per the Census of 2011 is

   (A) 1000 females per 1000 males

   (B) 1036 females per 1000 males

   (C) 840 females per 1000 males

   (D) 940 females per 1000 males

8. Which of the following combinations is **correct**?

   (A) NABARD – Industrial loans

   (B) IDBI – Short-term loans

   (C) RBI – Long-term loans

   (D) RRB – Agricultural finance

9. 'Import of Machinery' is recorded in the _____ Account and 'Borrowings from abroad' is recorded in the _____ Account.

   (A) Current, Capital

   (B) Capital, Current

   (C) Capital, Capital

   (D) Current, Current

10. "The value of all goods and services can be expressed in monetary units." On the basis of the given statement, identify the function performed by money.

    (A) Medium of exchange

    (B) Store of value

    (C) Unit of account

    (D) Means of standard of deferred payments

11. "Owing to the Russia-Ukraine crisis, the world is experiencing rising crude prices due to supply-side issues." Identify the most likely impact on the Balance of Payment situation of the Indian economy from the following.

(A) Production of cars in India will rise

(B) Production and sale of cycles in India will rise

(C) Inflow of US Dollars in India will rise

(D) Outflow of US Dollars from India will rise

12. Read the following statements carefully :

Statement—I : Export of financial services by India will be recorded on credit side of Current Account.

Statement—II : Foreign Direct Investments in India will be recorded on credit side of Capital Account.

In the light of the given statements, choose the *correct* alternative :

(A) **Statement—I** is true but **Statement—II** is false

(B) **Statement—I** is false but **Statement—II** is true

(C) Both **Statement—I** and **Statement—II** are true

(D) Both **Statement—I** and **Statement—II** are false

13. Read the following **Assertion (A)** and **Reason (R)**. Choose one of the *correct* alternatives given below :

Assertion (A) : Ex-post investments represent planned investments; whereas ex-ante investments represent actual level of investments.

Reason (R) : At equilibrium level, ex-ante savings and ex-ante investments are always equal.

(A) Both **Assertion (A)** and **Reason (R)** are true and **Reason (R)** is the correct explanation of **Assertion (A)**

(B) Both **Assertion (A)** and **Reason (R)** are true but **Reason (R)** is not the correct explanation of **Assertion (A)**

(C) **Assertion (A)** is true but **Reason (R)** is false

(D) **Assertion (A)** is false but **Reason (R)** is true

14. A positive balance in the Capital Account of the Balance of Payments of a country indicates that

(A) trade balance is positive

(B) currency is depreciating

(C) it is experiencing a budget surplus

(D) it is receiving more foreign investments than it is making abroad

15. _____ Committee was set up for the development and promotion of small-scale industries in India.

(A) The Karve

(B) The Tapas Majumdar

(C) The Mahalanobis

(D) TRYSEM

16. Read the following statements carefully :

Statement—I : On-the-job trainings help to bridge a gap between theoretical concepts and practical experiences.

Statement—II : On-the-job trainings update the employees, with the latest changes in their work field.

In the light of the given statements, choose the **correct** alternative :

(A) **Statement—I** is true but **Statement—II** is false

(B) **Statement—I** is false but **Statement—II** is true

(C) Both **Statement—I** and **Statement—II** are true

(D) Both **Statement—I** and **Statement—II** are false

17. Which of the following sectors was the major contributor to the Gross Domestic Product (GDP) during the British rule in India?

(A) Primary sector

(B) Secondary sector

(C) Tertiary sector

(D) None of the above

18. Which of the following statements **correctly** reflects the demographic profile of India on the eve of its independence?

(A) India had an average life expectancy of 63 years

(B) Both the birth rate and death rate in India were very low

(C) The overall levels of literacy in India was even less than 16 percent

(D) The infant mortality rate in India was just around 70 per every thousand live births

19. In which year was India's first official Census survey undertaken?

(A) 1881

(B) 1850

(C) 1891

(D) None of the above

20. Which of the following is **not** an advantage of the MSME sector?

(A) It is suited for the utilization of local resources

(B) It is helpful in creation of employment opportunities

(C) It requires more capital than labour

(D) It ensures equitable distribution of income in the country

21. MSME sector suffered to a large extent in COVID-19 pandemic situation due to

(A) excess availability of labour

(B) immediate liquidity and credit crunch

(C) over-dependence on imports

(D) rapid technological advancements

22. Read the following **Assertion (A)** and **Reason (R)**. Choose one of the *correct* alternatives given below :

Assertion (A) : Small-scale industries ensure a more equitable distribution of national income and wealth.

Reason (R) : The ownership of small-scale industries is more widespread than the ownership of large-scale industries.

(A) Both **Assertion (A)** and **Reason (R)** are true

(B) Both **Assertion (A)** and **Reason (R)** are false

(C) **Assertion (A)** is true but **Reason (R)** is false

(D) **Assertion (A)** is false but **Reason (R)** is true

23. If the Reserve Bank of India increases the reserve requirement for banks from 10% to 12% and the banks' total reserve is ₹ 1,000 crores, what will be the impact on the money supply?

(A) ₹ 200 crores

(B) ₹ 500 crores

(C) ₹ 800 crores

(D) ₹ 100 crores

24. The 'Liquidity Preference Theory' of interest rates was propounded by

(A) John Maynard Keynes

(B) Milton Friedman

(C) Irving Fisher

(D) A. C. Pigou

25. Which of the following Fisher's equations of exchange is *not correct*?

(A) MV=PT

(B) MV=PQ

(C) MV=PY

(D) MV=PR

26. The relationship between money supply and price level under quantity theory of money is

(A) direct non-proportionate relationship

(B) inverse proportionate relationship

(C) direct proportionate relationship

(D) inverse non-proportionate relationship

27. Expenditure method focuses on measurement of National income at

(A) phases of production of goods and services

(B) phase of income distribution

(C) phase of income disposition

(D) All of the above

28. GDP MP = ₹ 1,000 and subsidies = ₹ 50, then GDP FC will be

(A) ₹ 1,050

(B) ₹ 950

(C) ₹ 1,000

(D) ₹ 900

29. Which of the following is the primary objective of the 'Make in India' initiative launched by the Government of India in 2014?

(A) To increase Foreign Direct Investment (FDI) in the service sector

(B) To promote manufacturing and increase the share of the manufacturing sector in GDP

(C) To enhance agricultural productivity

(D) To reduce income inequality between rural and urban sectors

30. LM curve represents the combination of

(A) price and output

(B) demand for money and supply of money

(C) income and investment

(D) money supply and investment

31. Poverty gap is

(A) difference between poverty line and actual income level

(B) gap between rich and poor

(C) gap between developed ration and developing ration

(D) None of the above

32. A Rolling plan refers to a plan which

(A) does not change its target every year

(B) changes its allocation every year

(C) changes its allocation and target every year

(D) None of the above

33. What percentage of Indian GDP is contributed by the service sector?

(A) 25% of GDP

(B) 60% of GDP

(C) 53% of GDP

(D) 49% of GDP

34. Which of the following is the main function of a router in a computer network?

(A) To filter incoming and outgoing traffic

(B) To forward data packets between different networks

(C) To store data temporarily

(D) To convert digital signals to analog signals

35. Which of the following methods reflects the changes made in database permanently?

(A) <connection>.done()

(B) <connection>.final

(C) <connection>.reflect()

(D) <connection>.commit()

36. If I=[11, 22, 33, 44], then output of print(len(I)) will be

(A) 4

(B) 3

(C) 6

(D) 8

37. Which of the following forces is an expression to be converted into specific type?

(A) Implicit type casting

(B) Mutable type casting

(C) Immutable type casting

(D) Explicit type casting

38. Consider the following operation performed on a stack of size 3,what will be the output? (* top position)

Push(10)

Push(20)

Push(30)

Pop( )

Push(40)

Push(50)

(A) Overflow

(B) Underflow

(C) 10 20 30 40 50*

(D) 10 20 40 50*

39. The special control structure that facilitates row by row processing of records in resultset is

(A) tuple

(B) database cursor

(C) connection

(D) None of the above

40. What is the expanded form of XML?

(A) Extended Markup Language

(B) Extensible Markup Language

(C) Extra Markup Language

(D) None of the above

41. If X=10100 is in BCD and

Y=1010 is in 1's complement, then find X+Y in base 6.

(A) 056

(B) 019

(C) 031

(D) 007

42. Choose the **correct** option in terms of the memory capacities :

(A) Register < Cache < RAM < Secondary

(B) RAM < Cache < Register < Secondary

(C) Secondary < RAM < Cache < Register

(D) Cache < Secondary < RAM < Register

43. Which of the following transmission medias has the highest bandwidth?

(A) Coaxial cable

(B) Fiber-optic cable

(C) Twisted pair cable

(D) None of the above

44. Mandatory arguments required to connect any database from Python are

(A) Username, Password, Hostname, Database Name, Port

(B) Username, Password, Hostname

(C) Username, Password, Hostname, Database Name

(D) Username, Password, Hostname, Port

45. The technique of changing the characteristics of signal being transmitted is called

(A) demodulation

(B) transmission

(C) encryption

(D) modulation

46. What is the output of the following Python code snippet?

```
def func(x):
if x <=0:
    return 0
return x + func(x–1)
print(func(3))
```

(A) 3

(B) 6

(C) 0

(D) 10

47. Which of the following sorting algorithms is based on the divide and conquer strategy?

(A) Bubble sort

(B) Insertion sort

(C) Merge sort

(D) Selection sort

48. Which of the following functions gives the total number of rows in a given column or expression?

(A) SUM()

(B) COUNT()

(C) TOTAL()

(D) Both (A) and (B)

49. What is the output of the following Python code?

```
x = [1, 2, 3, 4]
print(x[1:3])
```

(A) [1, 2]

(B) [2, 3]

(C) [3, 4]

(D) [1, 2, 3]

50. The _____ clause places condition with aggregate functions.

(A) HAVING

(B) WHERE

(C) IN

(D) BETWEEN

51. Which of the following data structures is most appropriate for implementing a priority queue?

(A) Stack

(B) Queue

(C) Linked List

(D) Heap

52. Suppose list1 is [3, 4, 5, 20, 5, 25, 1, 3], what is list1 after list1.pop(1)?

(A) [3, 4, 5, 20, 5, 25, 1, 3]

(B) [1, 3, 3, 4, 5, 5, 20, 25]

(C) [3, 5, 20, 5, 25, 1, 3]

(D) [1, 3, 4, 5, 20, 5, 25]

53. To read the entire remaining contents of the file as a string from a file object infile, we use

(A) infile.read(2)

(B) infile.read()

(C) infile.readline()

(D) infile.readlines()

54.
```
for(i=1; i<=10; i++)
    for(j=1; j<=5; j++)
    printf("HI");
```

For the given C code snippet, how many times will HI be printed?

(A) 20 times

(B) 40 times

(C) 50 times

(D) 30 times

55. What is the function of the registers in a CPU?

(A) To hold data temporarily during processing

(B) To store data permanently

(C) To store the operating system

(D) To perform arithmetic operations

56. What will be the result of using the open('file.txt', 'r+') mode in Python?

(A) Opens the file for reading only

(B) Opens the file for reading and writing, but does not create the file if it does not exist

(C) Opens the file for writing only, truncating it if it exists

(D) Opens the file for both reading and writing, creating the file if it does not exist

57. Gbps is equal to

(A) 125 Mbps

(B) 125 bps

(C) 125 kbps

(D) 125 Gbps

58. Which of the following refers to the technique of breaking data into smaller packets to optimize the usage of the network?

(A) Multiplexing

(B) Packet switching

(C) Circuit switching

(D) Error correction

59. What is the purpose of BIOS (Basic Input/Output System) in a computer?

(A) To manage the operating system

(B) To control hardware peripherals

(C) To boot up the computer and perform diagnostics

(D) To store application software

60. If 301 and 422 are in base 6, their difference in base 8 will be

(A) 077

(B) 065

(C) 049

(D) 053

61. What will happen when the following code is run?

    x=[1, 2, 3]
    print(x.pop(5))

(A) IndexError

(B) TypeError

(C) ValueError

(D) KeyError

62. What will be the result of the following Python code?

    x=[1, 2, 3, 4]
    x.append([5, 6])
    print(x)

(A) [1, 2, 3, 4, 5, 6]

(B) [1, 2, 3, 4, [5, 6]]

(C) [1, 2, 3, 4, 5]

(D) [[1, 2, 3, 4], [5, 6]]

63. Which protocol is used for secure communication over a network?

(A) HTTP

(B) FTP

(C) HTTPS

(D) SMTP

64. Which of the following can be stored in a CSV file?

(A) Strings, numbers and dates

(B) Strings only

(C) Numbers only

(D) Only images

65. If a file is opened using the w+ mode, then what happens if the file already exists?

(A) The file is opened for writing and all the data is preserved

(B) The file is opened for reading and writing, and the content is truncated

(C) The file is opened for reading and writing without truncating the content

(D) An error occurs because the file cannot be opened for both reading and writing

66. What will happen, if you try to open a CSV file for reading that **does not** exist in Python?

(A) The program will crash

(B) Python will create a new file

(C) Python will raise a FileNotFoundError

(D) The program will ignore the error and continue

67. What is the main function of the Control Unit (CU) in a computer?

(A) Perform arithmetic calculations

(B) Manage data storage

(C) Fetch and decode instructions

(D) Store and retrieve data

68. Consider the following relations :

$R = \{(x, y) \mid x$ and y are real numbers and $x = wy$ for some rational number $w\}$;

$$S = \left\{ \left(\frac{m}{n}, \frac{p}{q}\right) \mid m, n, p \text{ and } q \text{ are integers} \right.$$

such that $n, q \neq 0$ and $qm = pn \Big\}$.

Then

(A) R is an equivalence relation but S is not an equivalence relation

(B) neither R nor S is an equivalence relation

(C) S is an equivalence relation but R is not an equivalence relation

(D) R and S both are equivalence relations

69. Let R be a relation defined by $R = \{(4, 5), (1, 4), (4, 6), (7, 6), (3, 7)\}$, then $R^{-1} \circ R$ is

(A) $\{(1, 1), (4, 4), (4, 7), (7, 4), (7, 7), (3, 3)\}$

(B) $\{(1, 1), (4, 4), (7, 7), (3, 3)\}$

(C) $\{(1, 5), (1, 6), (3, 6)\}$

(D) None of the above

70. For each real number x such that $-1 < x < 1$, let

$$A(x) = \begin{bmatrix} \dfrac{1}{1-x} & -\dfrac{x}{1-x} \\ -\dfrac{x}{1-x} & \dfrac{1}{1-x} \end{bmatrix} \text{ and } z = \frac{x+y}{1+xy}.$$

Then

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

(B) $A(z) = A(x)[A(y)]^{-1}$

(C) $A(z) = A(x) \cdot A(y)$

(D) $A(z) = A(x) - A(y)$

71. If both $\left(A-\frac{1}{2}I\right)$ and $\left(A+\frac{1}{2}I\right)$ are orthogonal matrices, then

(A) A is orthogonal

(B) A is skew-symmetric matrix

(C) A is symmetric matrix

(D) None of the above

72. If $A = \begin{bmatrix} 5a & -b \\ 3 & 2 \end{bmatrix}$ and A adj $A = AA^T$, then $5a + b$ is equal to

(A) -1

(B) 5

(C) 4

(D) 13

73. The set of all values of λ for which the system of linear equations $2x_1 - 2x_2 + x_3 = \lambda x_1$, $2x_1 - 3x_2 + 2x_3 = \lambda x_2$ and $-x_1 + 2x_2 = \lambda x_3$ has a non-trivial solution.

(A) It is an empty set

(B) It is a singleton set

(C) It contains two elements

(D) It contains more than two elements

74. Let $f : [a, b] \to R$ be any function such that $f(x)$ is rational for irrational x and $f(x)$ is irrational for rational x. Then, in $[a, b]$

(A) f is discontinuous everywhere

(B) f is continuous only at $x = 0$

(C) f is continuous for all irrational x and discontinuous for all rational x

(D) f is continuous for all rational x and discontinuous for all irrational x

75. If $f(x) = |\sin x|$, then

(A) f is everywhere differentiable

(B) f is everywhere continuous but not differentiable at $x = n\pi$, $n \in Z$

(C) f is everywhere continuous but not differentiable at $x = \dfrac{(2n+1)\pi}{2}$, $n \in Z$

(D) None of the above

76. If $\sin y = x \sin(a + y)$, then $\dfrac{dy}{dx}$ is equal to

(A) $\dfrac{\sin a}{\sin^2(a+y)}$

(B) $\dfrac{\sin^2(a+y)}{\sin a}$

(C) $\sin a \cdot \sin^2(a+y)$

(D) $\dfrac{\sin^2(a-y)}{\sin a}$

77. If $3f(x) - 2f(1/x) = x$, then $f'(2)$ is equal to

(A) $2/7$

(B) $1/2$

(C) 2

(D) $7/2$

78. If $y = \sec^{-1}\left[\dfrac{\sqrt{x}+1}{\sqrt{x}-1}\right] + \sin^{-1}\left[\dfrac{\sqrt{x}-1}{\sqrt{x}+1}\right]$, then $\dfrac{dy}{dx}$ is equal to

(A) 0

(B) $\dfrac{1}{\sqrt{x}+1}$

(C) 1

(D) None of the above

79. Oil is leaking at the rate of $16\ \mathrm{cm^3/s}$ from a vertically kept cylindrical drum containing oil. If the radius of the drum is 7 cm and its height is 60 cm, then the rate at which the level of the oil is changing when oil level is 18 cm, is

(A) $(-16)/49\pi$

(B) $(-16)/48\pi$

(C) $16/47\pi$

(D) $(-16)/47\pi$

80. The length of the longest interval, in which the function $3\sin x - 4\sin^3 x$ is increasing, is

(A) $\pi/3$

(B) $\pi/2$

(C) $3\pi/2$

(D) π

81. Function $f(x) = \dfrac{\lambda \sin x + 6\cos x}{2\sin x + 3\cos x}$ is monotonic increasing, if

(A) $\lambda > 1$

(B) $\lambda < 1$

(C) $\lambda < 4$

(D) $\lambda > 4$

82. If the function $f(x) = 2x^3 - 9ax^2 + 12a^2 x + 1$, where $a > 0$ attains its maximum and minimum at p and q respectively such that $p^2 = q$, then a is equal to

(A) 3

(B) 1

(C) 2

(D) 1/2

83. A straight line is drawn through the point $P(3, 4)$ meeting the positive direction of coordinate axes at the points A and B. If O is the origin, then minimum area of $\triangle OAB$ is equal to

(A) 12 sq. units

(B) 6 sq. units

(C) 24 sq. units

(D) 48 sq. units

84. The integral $\displaystyle\int \dfrac{dx}{x^2 \left(x^4 + 1\right)^{\frac{3}{4}}}$ equals

(A) $\left(\dfrac{x^4 + 1}{x^4}\right)^{\frac{1}{4}} + C$

(B) $\left(x^4 + 1\right)^{\frac{1}{4}} + C$

(C) $-\left(x^4 + 1\right)^{\frac{1}{4}} + C$

(D) $-\left(\dfrac{x^4 + 1}{x^4}\right)^{\frac{1}{4}} + C$

85. If $\displaystyle\int \dfrac{\tan x}{1 + \tan x + \tan^2 x}\, dx = x - \dfrac{2}{\sqrt{A}} \tan^{-1}\left(\dfrac{2\tan x + 1}{\sqrt{A}}\right) + C,$

then the value of A is

(A) 1

(B) 2

(C) 3

(D) None of the above

86. If $f(x) = \displaystyle\int \dfrac{x^2 dx}{\left(1+x^2\right)\left(1+\sqrt{1+x^2}\right)}$ and

$f(0) = 0$, then $f(1)$ is

(A) $\log\left(1+\sqrt{2}\right)$

(B) $\log\left(1+\sqrt{2}\right) - \dfrac{\pi}{4}$

(C) $\log\left(1+\sqrt{2}\right) + \dfrac{\pi}{2}$

(D) None of the above

87. Let a, b and c be non-zero real numbers such that

$\displaystyle\int_0^3 (3ax^2 + 2bx + c)dx = \int_1^3 (3ax^2 + 2bx + c)dx,$

then

(A) $a + b + c = 3$

(B) $a + b + c = 2$

(C) $a + b + c = 0$

(D) $a + b + c = 1$

88. $\displaystyle\int_{-\pi}^{\pi} \dfrac{2x(1+\sin x)}{1+\cos^2 x} dx$ is equal to

(A) $\pi^2/4$

(B) π^2

(C) 0

(D) $\pi/2$

89. The area between the curve $y = 4 - |x|$ and X-axis is

(A) 16 sq. units

(B) 20 sq. units

(C) 12 sq. units

(D) 18 sq. units

90. The area bounded by the curve $xy^2 = 4(2 - x)$ and Y-axis is

(A) 2π

(B) 4π

(C) 12π

(D) 6π

91. Solution of the equation $(x+y)^2 \dfrac{dy}{dx} = 4,\ y(0) = 0$ is

(A) $y = 2\tan^{-1} \dfrac{x+y}{2}$

(B) $y = 4\tan^{-1} \dfrac{x+y}{4}$

(C) $y = 4\tan^{-1} \dfrac{x+y}{2}$

(D) None of the above

92. If $y(x)$ satisfies the differential equation $y' - y\tan x = 2x\sec x$ and $y(0) = 0$, then

(A) $y\left(\dfrac{\pi}{4}\right) = \dfrac{\pi^2}{8\sqrt{2}}$

(B) $y'\left(\dfrac{\pi}{4}\right) = \dfrac{\pi^2}{18}$

(C) $y\left(\dfrac{\pi}{3}\right) = \dfrac{\pi^2}{9}$

(D) $y'\left(\dfrac{\pi}{3}\right) = \dfrac{\pi^2}{3\sqrt{3}} + \dfrac{4\pi}{3}$

93. If $\theta = \tan^{-1} a$, $\phi = \tan^{-1} b$ and $ab = -1$, then $(\theta - \phi)$ is equal to

(A) 0

(B) $\pi/4$

(C) $\pi/2$

(D) None of the above

94. If $\sin^{-1} x + \sin^{-1} y + \sin^{-1} z = \dfrac{3\pi}{2}$,

then the value of

$$\sum \dfrac{\left(x^{101} + y^{101}\right)\left(x^{202} + y^{202}\right)}{\left(x^{303} + y^{303}\right)\left(x^{404} + y^{404}\right)} \text{ is}$$

(A) 0

(B) 1

(C) 2

(D) 3

95. The distance of the point B with position vector $\hat{i} + 2\hat{j} + 3\hat{k}$ from the line passing through the point A, whose position vector is $4\hat{i} + 2\hat{j} + 2\hat{k}$ and parallel to the vector $2\hat{i} + 3\hat{j} + 6\hat{k}$ is

(A) $\sqrt{10}$

(B) $\sqrt{5}$

(C) $\sqrt{6}$

(D) $\sqrt{8}$

96. Let $\vec{a}, \vec{b}$ and $\vec{c}$ be three non-zero vectors which are pair-wise non-collinear. If $\vec{a} + 3\vec{b}$ is collinear with $\vec{c}$ and $\vec{b} + 2\vec{c}$ is collinear with $\vec{a}$, then $\vec{a} + 3\vec{b} + 6\vec{c}$ is equal to

(A) $a + c$

(B) a

(C) c

(D) 0

97. The angle between the lines $2x = 3y = -z$ and $6x = -y = -4z$ is

(A) 30°

(B) 45°

(C) 90°

(D) 0°

98. The foot of perpendicular from $(0, 2, 3)$ to the line $\dfrac{x+3}{5} = \dfrac{y-1}{2} = \dfrac{z+4}{3}$ is

(A) $(-2, 3, 4)$

(B) $(2, -1, 3)$

(C) $(2, 3, -1)$

(D) $(3, 2, -1)$

99. If the odd in favour of an event are 4 to 7, then find the probability of its no occurrence.

(A) 9/11

(B) 7/11

(C) 4/11

(D) 3/11

100. If $P(A) = 0.4$, $P(B) = 0.8$ and $P(B \mid A) = 0.6$, then $P(A \cup B)$ is equal to

(A) 0.24

(B) 0.3

(C) 0.48

(D) 0.96

SPACE FOR ROUGH WORK

★ ★ ★