DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

Test Booklet No. :

Series

A

00189

TEST BOOKLET

GENERAL KNOWLEDGE

(Paper—II)

Time Allowed : 2 Hours **Full Marks : 100**

Read the following instructions carefully before you begin to answer the questions :

1. The name of the Subject, Roll Number as mentioned in the Admission Certificate, Test Booklet No. and Series are to be written legibly and correctly in the space provided on the Answer-Sheet with Black/Blue ballpoint pen.
2. **Answer-Sheet without marking Series as mentioned above in the space provided for in the Answer-Sheet shall not be evaluated.**
3. All questions carry equal marks.

   The Answer-Sheet should be submitted to the Invigilator.

   Directions for giving the answers : Directions for answering questions have already been issued to the respective candidates in the 'Instructions for marking in the OMR Answer-Sheet' along with the Admit Card and Specimen Copy of the OMR Answer-Sheet.

   Example :

   Suppose the following question is asked :

   The capital of Bangladesh is
   (A) Chennai
   (B) London
   (C) Dhaka
   (D) Dhubri

   You will have four alternatives in the Answer-Sheet for your response corresponding to each question of the Test Booklet as below :

   Ⓐ Ⓑ Ⓒ Ⓓ

   In the above illustration, if your chosen response is alternative (C), i.e., Dhaka, then the same should be marked on the Answer-Sheet by blackening the relevant circle with a Black/Blue ballpoint pen only as below :

   Ⓐ Ⓑ ● Ⓓ

   The example shown above is the only correct method of answering.
4. Use of eraser, blade, chemical whitener fluid to rectify any response is prohibited.
5. Please ensure that the Test Booklet has the required number of pages (23) and 100 questions immediately after opening the Booklet. In case of any discrepancy, please report the same to the Invigilator.
6. No candidate shall be admitted to the Examination Hall/Room 20 minutes after the commencement of the examination.
7. No candidate shall leave the Examination Hall/Room without prior permission of the Supervisor/Invigilator. No candidate shall be permitted to hand over his/her Answer-Sheet and leave the Examination Hall/Room before expiry of the full time allotted for each paper.
8. No Mobile Phone, Electronic Communication Device, etc., are allowed to be carried inside the Examination Hall/Room by the candidates. Any Mobile Phone, Electronic Communication Device, etc., found in possession of the candidate inside the Examination Hall/Room, even if on off mode, shall be liable for confiscation.
9. No candidate shall have in his/her possession inside the Examination Hall/Room any book, notebook or loose paper, except his/her Admission Certificate and other connected papers permitted by the Commission.
10. Complete silence must be observed in the Examination Hall/Room. No candidate shall copy from the paper of any other candidate, or permit his/her own paper to be copied, or give, or attempt to give, or obtain, or attempt to obtain irregular assistance of any kind.
11. This Test Booklet can be carried with you after answering the questions in the prescribed Answer-Sheet.
12. Noncompliance with any of the above instructions will render a candidate liable to penalty as may be deemed fit.
13. No rough work is to be done on the OMR Answer-Sheet. You can do the rough work on the space provided in the Test Booklet.

N.B. : There will be negative marking @ 0·25 per 1 (one) mark against each wrong answer.

SEAL

[No. of Questions : 100]

1. Banu Mushtaq's *Heart Lamp*, which won the International Booker Prize 2025, chronicles the

   (A) struggles of a mother of four who is trying to save her family as her country slips into totalitarianism

   (B) story of six fictional astronauts over 24 hours in an orbiting space station

   (C) everyday lives of women and girls in patriarchal communities in Southern India

   (D) story of a murdered war photographer

2. Identify the first Indian State which achieved full functional literacy.

   (A) Mizoram

   (B) Kerala

   (C) Maharashtra

   (D) Assam

3. The vision of this scheme is to make 'Bharat—Jan Jan Saakshar' and is based on the spirit of 'Kartavya Bodh' and is being implemented on volunteerism. Identify the scheme referred to here.

   (A) Atmanirbhar Bharat Abhiyan

   (B) ULLAS

   (C) PM SVANidhi

   (D) Samagra Shiksha

4. 'Poshan Pakhwada', an annual nutrition awareness drive and a key initiative of the Government of India's Poshan Abhiyan emphasized on four key themes in 2025. Which of the following is one of the four key themes of 2025?

   (A) Popularization of seafood

   (B) Promotion and popularization of millets

   (C) Focus on first 1000 days of life

   (D) Strengthening of Saksham Anganwadis

5. With reference to India's Geographical Indication (GI) products, consider the following statements and select the correct statement(s) from the codes given below.

   (i) India is home to more than 1000 GI-tagged products.

   (ii) The first Indian product to receive a GI tag under the natural product category was Darjeeling tea.

   (iii) Makrana marble, the stone that was also used to build the Taj Mahal, is a GI-tagged product and is uniquely sourced in Gujarat.

   (iv) Muga silk and Majuli masks have been GI tagged.

   Codes :

   (A) (i) and (ii)

   (B) (ii) and (iii)

   (C) (ii) and (iv)

   (D) All of the above

6. Consider the following statements in respect to Axiom Mission 4 (Ax-4) and select the correct statement(s) from the codes given below.

(i) It is a private spaceflight to the International Space Station (ISS).

(ii) Axiom Space has partnered with SpaceX and NASA to operate this mission.

(iii) Its crew consists of four astronauts, one each from India, Poland, Hungary and the USA.

(iv) Tibor Kapu of Hungary is the Commander of the mission.

Codes :

(A) (i) and (ii)

(B) (i), (ii) and (iii)

(C) (i), (ii) and (iv)

(D) All statements are correct

7. Recently, one of the States became the first in India to implement the Scheduled Caste sub-categorization. With reference to this, consider the following statements and select the correct statement(s) from the codes given below.

(i) Sub-categorization aims to address the intra-category inequalities and ensure a more equitable distribution of benefits.

(ii) Andhra Pradesh is the first State to implement SC sub-categorization.

(iii) The Madiga community primarily in Telangana, Andhra Pradesh and Karnataka have been actively involved in agitation for sub-categorization of the SCs.

(iv) The Supreme Court of India, in the case of E. V. Chinnaiah vs. the State of Andhra Pradesh, asserted that States have the authority to sub-classify SCs and STs based on varying levels of backwardness.

Codes :

(A) (i) and (ii)

(B) (i) and (iii)

(C) (i) and (iv)

(D) (i), (iii) and (iv)

8. In 2004, the Indian Government began designating languages as 'Classical Languages' to acknowledge and preserve their ancient legacy. In 2024, Assamese language was also granted classical language status. With reference to the revised criteria for designating languages as classical language in 2024, consider the following statements and select the correct one from the codes given below.

(i) High antiquity of (its) early texts/recorded history over a period of 500 to 1000 years.

(ii) A rich body of ancient literature/texts, which is considered a heritage by generations of speakers.

(iii) Presence of an original literary tradition not borrowed from another speech community.

(iv) The language should possess knowledge texts, particularly prose texts, alongside poetry and epigraphical evidence.

Codes :

(A) (i)

(B) (ii) and (iii)

(C) (ii), (iii) and (iv)

(D) All statements are correct

9. The Government of India's 'One Nation One Subscription' (ONOS) scheme is related to which of the following?

(A) Scholarly research articles and journal publications from prominent international publishers

(B) Uniform Civil Code

(C) One-time subscription to OTT

(D) Ration Cards

10. Consider the following statements about 'Marrakech Partnership' and select the correct statement(s) from the codes given below.

(i) The Marrakech Partnership for Global Climate Action was launched at COP22 in 2016.

(ii) The Marrakech Partnership for Global Climate Action is an effort to support the implementation of Paris Agreement.

(iii) It is not only an inter-governmental partnership for Global Climate Action but also a collaboration between governments and other stake-holders like cities, regions, businesses, investors and civil society organizations.

(iv) This partnership is one of the upshots of Montreal Protocol on ozone layer protection.

Codes :

(A) (i) and (ii)

(B) (ii) and (iii)

(C) (i), (ii) and (iii)

(D) (iv)

11. Consider the following statements and select the correct statement(s) using the codes given below.

(i) Recently, the Government of Assam has proposed to construct a 3400 MW thermal power plant.

(ii) Recently, the Government of Assam has proposed to construct a 3400 MW hydro-power plant.

(iii) The proposed plant will be constructed in Lakhimpur district.

(iv) The proposed plant will be constructed in the Western part of Assam.

Codes :

(A) (i)

(B) (ii)

(C) (i) and (iv)

(D) (ii) and (iii)

12. Identify the State/Union Territory, whose tableau won the first prize in the Republic Day Parade, 2025 in the State/Union Territory category.

(A) Uttar Pradesh

(B) Gujarat

(C) Uttarakhand

(D) Pondicherry

13. Match the following using the codes given below.

I.	Raimona National Park	1.	Kokrajhar-Chirang
II.	Sikhna Jwhwlao National Park	2.	Tinsukia
III.	Dibru-Saikhowa National Park	3.	Kokrajhar
IV.	Dehing Patkai National Park	4.	Dibrugarh-Tinsukia

Codes :

(A) I—4, II—2, III—3, IV—1

(B) I—3, II—1, III—2, IV—4

(C) I—2, II—3, III—4, IV—1

(D) I—1, II—4, III—3, IV—2

14. As per the IMF data 2025, India's GDP stands at $ 4·19 trillion. With reference to this, which are the top five economies of the world, starting from the first to the fifth?

(A) USA, China, Japan, India, Germany

(B) China, USA, Germany, India, Japan

(C) China, Germany, USA, India, Japan

(D) USA, China, Germany, India, Japan

15. Match the following Ramsar sites with the States they are located in using the codes given below.

I.	Pala Wetland	1.	Tripura
II.	Rudrasagar Lake	2.	Mizoram
III.	Asan Conservation Reserve	3.	Madhya Pradesh
IV.	Bhoj Wetland	4.	Uttarakhand

Codes :

(A) I—4, II—3, III—2, IV—1

(B) I—3, II—2, III—1, IV—4

(C) I—2, II—1, III—4, IV—3

(D) I—1, II—4, III—3, IV—2

16. Identify the correct statement with reference to Chandrayaan–3, India's third Lunar Mission.

(A) On August 23, 2023, ISRO's Chandrayaan–3 mission achieved a safe and soft landing of the Vikram lander on the moon's surface, making India the second country to land near its southern polar region.

(B) The landing site was named Bharat Sthal.

(C) The landing site was named India Shakti point.

(D) To commemorate this historic achievement, August 23 has been celebrated as the National Space Day, since 2024.

17. Identify the correct statement(s) with reference to *Sonar Baran Pakhi*, a biographic film based on the life of folk singer Pratima Barua Pandey using the codes given below.

(i) It is the first Rajbanshi language film.

(ii) It was voted 'Best Feature Film' at the Indian Film Festival of Los Angeles.

(iii) The film was directed by Bobby Sarma Baruah.

(iv) The film won Special Jury Mention in the Cannes Film Festival.

Codes :

(A) (i)

(B) (i) and (ii)

(C) (i), (ii) and (iii)

(D) All statements are correct

18. Maha Kumbh Mela is held in every

(A) 12 years

(B) 100 years

(C) 125 years

(D) 144 years

19. Match the books with their authors using the codes given below.

I.	*Bon Phul*	1.	Anuradha Sharma Pujari
II.	*Bhool Satya*	2.	Jatindra Nath Duwara
III.	*Iyat Akhon Aranya Asil*	3.	Dipak Kumar Sharma
IV.	*Bhaskaracaritam*	4.	Manoj Kumar Goswami

Codes :

(A) I—2, II—4, III—1, IV—3

(B) I—4, II—1, III—3, IV—2

(C) I—3, II—2, III—4, IV—1

(D) I—1, II—3, III—2, IV—4

20. India's S-400 air defense system, also known as 'Sudarshan Chakra', is one of the world's most advanced long-range surface-to-air missile (SAM) system. Identify the correct statement with reference to the S-400 defense system.

(A) The S-400 air defense system is developed by Russia's Uralvagonzavod.

(B) The S-400 air defense system is an indigenously developed air defense system.

(C) Missiles of the S-400 air defense system can reach a maximum speed of up to 17000 km/h (approximately Mach-14).

(D) The S-400 is not designed for quick deployment.

21. Consider the following statements and select the correct answer.

(A) *Crepidium assamicum* is a new variety of rice recently developed in Assam.

(B) *Crepidium assamicum* is a new variety of orchid recently discovered in Assam.

(C) *Crepidium assamicum* is a new variety of orchid recently discovered in Arunachal Pradesh.

(D) *Crepidium assamicum* is the scientific name of Assam tea.

22. AI hallucinations refer to

(A) limited long-term memory of Large Language Model (LLM)

(B) incorrect or misleading results generated by AI models, often presented as facts

(C) biased and prejudiced content generated by LLMs

(D) limited reasoning skill of LLMs

23. Recently, the Governments of Assam and Meghalaya have announced a collaborative initiative to establish a 55 MW hydropower and irrigation project. With reference to this, identify the correct statement(s) using the codes given below.

(i) The proposed project will harness the Kulsi river, a tributary of the Brahmaputra, to generate electricity and provide irrigation facility.

(ii) Kulsi river is about 60 km long with an average width of 70 to 80 metres.

(iii) The project aims to address the issue of urban flooding in Guwahati.

(iv) The project will be funded by the Tata Group.

Codes :

(A) (i)

(B) (i) and (ii)

(C) (i) and (iii)

(D) (i) and (iv)

24. The Jan Aushadhi Kendra (JAK) Experiential Learning Program was launched by the Government of India from 1st June, 2025. With reference to this, identify the correct statement(s) using the codes given below.

(i) The program was launched by the Ministry of Youth Affairs and Sports, in collaboration with the Department of Pharmaceuticals.

(ii) The program will draw volunteers from platforms such as MY Bharat, NSS, MYB Kendra, Pharmacy Colleges and other youth organizations.

(iii) The program aims to enhance community engagement and youth skill development.

(iv) The program will help the volunteers to gain practical exposure to the functioning of Jan Aushadhi Kendras.

Codes :

(A) (i)

(B) (i) and (ii)

(C) (i), (ii) and (iii) only

(D) All statements are correct

25. Consider the following statements and select the correct one using the codes given below.

(i) Nurdles are small pre-formed plastic pallets used as raw material in the production of various plastic products.

(ii) Nurdles are sub-group of brown seaweed that grows in cold nutrient-rich waters.

(iii) Nurdles are small organisms which are in competition with humans for some resource.

(iv) The sinking of the MSC ELSA 3, a Liberian-flagged cargo vessel released a significant quantity of nurdles into the Arabian Sea, causing them to wash ashore along the Kerala and Tamil Nadu coasts.

Codes :

(A) (i) only

(B) (ii) only

(C) (i) and (iv)

(D) (iii) and (iv)

26. Find the missing term in the series :

1, 0, 3, 2, 5, 4, ____, 6, 9, 8

(A) 7

(B) 8

(C) 9

(D) 10

27. Pointing to a man in a photograph, a woman said, "His brother's father is the only son of my grandfather." How is the woman related to the man in the photograph?

(A) Mother

(B) Daughter

(C) Sister

(D) Granddaughter

Directions (For Q. Nos. **28** to **30**) : Study the following information to answer the given questions.

There is a cube in which one pair of adjacent faces is painted red, the second pair of adjacent faces is painted blue and the third pair of adjacent faces is painted green. This cube is now cut into 216 identical smaller cubes.

28. How many small cubes will be there with no red paint at all?

(A) 144

(B) 150

(C) 125

(D) None of the above

29. How many small cubes will be there with at least two different colours on their faces?

(A) 64

(B) 54

(C) 33

(D) 44

30. How many small cubes will be there with both red and green on their faces?

(A) 8

(B) 12

(C) 16

(D) None of the above

Directions (For Q. Nos. **31** to **33**) : Study the following information to answer the given questions.

(i) Seven students *A, B, C, D, E, F* and *G* are standing in a row (not necessarily in the same order) facing a particular direction.

(ii) Number of students between *B* and *C* is same as that between *C* and *G*.

(iii) *A* and *D* are neighbours and so are *C* and *F*.

(iv) *D* is standing third from the extreme left, and is third to the left of *E*.

31. Which of the following gives two pairs of neighbours?

(A) *A* & *C* and *B* & *C*

(B) *A* & *B* and *F* & *G*

(C) *C* & *F* and *C* & *E*

(D) *D* & *C* and *E* & *F*

32. Which of the following statements is true?

(A) *C* & *E* are neighbours

(B) *E* is at the immediate left to *F*

(C) *C* is at the immediate left to *D*

(D) *A* is at the immediate left to *D*

33. Who is standing at the extreme right?

(A) *G*

(B) *B*

(C) Data inadequate

(D) *E*

34. Mamoni went 15 km to the West from her house, then turned left and walked 20 km. She then turned East and walked 25 km and finally turned left and walked 20 km. How far was she from her house?

(A) 5 km

(B) 10 km

(C) 8 km

(D) None of the above

35. Find the missing letter in the following series :

Z Y X W T S R Q N M L K ____.

(A) H

(B) I

(C) J

(D) G

Directions (For Q. Nos. **36** to **38**) : Study the following sequence and answer the questions given below.

P Q A 4 M % S 5 C 4 # K E @ 3
S D & 1 8 G 3 U $ 9 H W @ L

36. How many consonants are there in the arrangement, each of which is immediately followed by a vowel but not immediately preceded by a number?

(A) 1

(B) 2

(C) 3

(D) 4

37. Which of the following is the 6th to the left of the 13th from the left end in the arrangement?

(A) M

(B) G

(C) S

(D) &

38. How many such consonants are there in the arrangement, each of which is either immediately preceded by a vowel or immediately followed by a symbol but not both?

(A) 0

(B) 1

(C) 2

(D) 3

39. If AxB means $A^2 + B^2$ and AyB means $A^2 - B^2$, then evaluate (4x5)y(6x7).

(A) 4466

(B) –5544

(C) 3434

(D) –3434

40. Three of the following four are alike in a particular pattern and hence, form a group. Find the one which does ***not*** belong to the group.

(A) 248

(B) 224

(C) 236

(D) 268

41. Three of the following four are alike in a particular pattern and hence, form a group. Find the one which does ***not*** belong to the group.

(A) Mosquito

(B) Spider

(C) Housefly

(D) Bee

42. In a certain code, if the word SOME is coded as MSEO, and the word NAME is coded as MNEA, then the code for WARM is

(A) WMAR

(B) ARWM

(C) RWMA

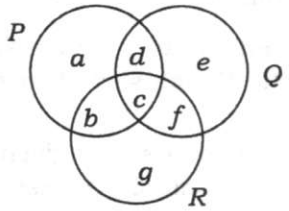
(D) MWRA

43. If the second hand of a wall clock moves by 300°, then by how many degrees does the minute hand move in the same time?

(A) 5° (B) 20°

(C) 30° (D) 150°

Directions (For Q. Nos. **44** and **45**) : The following figure consists of three intersecting circles that represents the students of class X of a school. The students who like the subjects Computer, Mathematics and Biology are represented by circles P, Q and R respectively as shown below.



44. Which letter in the figure represents the student who likes both Computer and Mathematics but not Biology?

(A) b

(B) c

(C) d

(D) f

45. Which letter in the figure represents the student who likes only Computer but does not like Mathematics and Biology?

(A) c (B) a

(C) b (D) d

46. Two statements are given, followed by two conclusions. Assuming the statements to be true, decide which conclusion(s) logically follows/follow from the given statements.

Statements :

1. Some cats are dogs.
2. Some dogs are tigers.

Conclusions :

I. Some tigers are dogs.

II. Some cats are tigers.

(A) Only Conclusion I follows

(B) Only Conclusion II follows

(C) Both the Conclusions I and II follow

(D) Neither the Conclusion I nor the Conclusion II follows

47. Two statements are given, followed by two conclusions. Assuming the statements to be true, decide which conclusion(s) logically follows/follow from the given statements.

Statements :

1. Some painters are not writers.
2. All writers are thinkers.

Conclusions :

I. Some thinkers are painters.

II. Some writers are not painters.

(A) Only Conclusion I follows

(B) Only Conclusion II follows

(C) Both the Conclusions I and II follow

(D) Neither the Conclusion I nor the Conclusion II follows

48. How often five bells ring together in one hour, if they start together and ring at intervals of 5, 6, 8, 12 and 20 seconds?

(A) 30

(B) 31

(C) 36

(D) None of the above

49. Study the following information to answer the given questions :

(i) @ means 'greater than'

(ii) # means 'less than'

(iii) $ means 'not equal to'

(iv) % means 'equal to'

It is given that X @ Y, Y # Z, Z @ U and U % X, then

(A) Z @ X

(B) Z # X

(C) Z $ X

(D) None of the above

50. The total of ages of four adults are 100 years at present. What was the total of their ages five years ago?

(A) 95 years

(B) 90 years

(C) 85 years

(D) 80 years

51. One of the integrating factors of

$$(x^3 + y^3)dx - xy^2dy = 0$$

is

(A) x^2

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

(C) x^4

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

52. The function

$$f(x) = |x| + |x-1| + |x-2|$$

is continuous at

(A) $x = 0$

(B) $x = 1$ and $x = 2$

(C) $x = 0, 1, 2$

(D) None of the above

53. Determine the nature of the locus represented by the equation

$$(x-1)(x-2) + (y-3)(y-4) = 0$$

(A) A circle

(B) A parabola

(C) A hyperbola

(D) An ellipse

54. The maximum value of the function

$$f(x) = 2x^3 - 9x^2 + 12x + 5$$

is

(A) 27

(B) 36

(C) 10

(D) 100

55. Find the equation of the plane which passes through (2, 1, 4) and is perpendicular to each of the planes $9x - 7y + 6z + 48 = 0$ and $x + y - z = 0$.

(A) $x + 5y + 4z = 27$

(B) $x + 15y + 4z = 36$

(C) $x + 15y + 16z = 81$

(D) $x + 5y + 16z = 27$

56. Determine the unit vector perpendicular to both $\vec{A} = 4\hat{i} + 3\hat{j} - \hat{k}$ and $\vec{B} = 2\hat{i} - 6\hat{j} - 3\hat{k}$.

(A) $\frac{3}{7}\hat{i} + \frac{2}{7}\hat{j} + \frac{2}{7}\hat{k}$

(B) $-\frac{3}{7}\hat{i} + \frac{2}{7}\hat{j} - \frac{6}{7}\hat{k}$

(C) $\frac{2}{3}\hat{i} + \frac{1}{3}\hat{j} - \frac{2}{3}\hat{k}$

(D) $-\frac{6}{7}\hat{i} + \frac{1}{7}\hat{j} + \frac{9}{7}\hat{k}$

57. The area of the parallelogram whose adjacent sides are $\hat{i}+2\hat{j}+3\hat{k}$ and $3\hat{i}-2\hat{j}+\hat{k}$ is

(A) $4\sqrt{2}$ sq. unit

(B) $3\sqrt{2}$ sq. unit

(C) $3\sqrt{3}$ sq. unit

(D) $8\sqrt{3}$ sq. unit

58. Find the interval for which the function $f(x)=x^2-2x+3$ is increasing.

(A) $(1, \infty)$

(B) $(1, 2)$

(C) $(1, -2)$

(D) $(-\infty, 1)$

59. $\lim_{x\to\infty}(x)^{\frac{1}{x}}=?$

(A) 1

(B) 0

(C) ∞

(D) Does not exist

60. The radius of a balloon is increasing at the rate of 10 cm/sec. At what rate is the surface area of the balloon increasing when the radius is 15 cm?

(A) 49π cm^2/sec

(B) 100π cm^2/sec

(C) 800π cm^2/sec

(D) 1200π cm^2/sec

61. In an additive group of integers, the order of identity element is

(A) finite

(B) infinite

(C) zero

(D) one

62. The set of {5, 15, 25, 35} is a group under multiplication modulo 40. The identity element of this group is

(A) 5

(B) 15

(C) 25

(D) 35

63. The series

$$\sum_{n=1}^{\infty}\sin(4n+1)\frac{\pi}{2}$$

(A) converges to 0

(B) converges to 1

(C) converges to –1

(D) does not converge

64. If $\phi(x, y, z) = 3x^2y - y^3z^2$, then find $\nabla\phi$ at the point (1, –2, –1).

(A) $12\hat{i} + 4\hat{j} - 16\hat{k}$

(B) $4\hat{i} - 9\hat{j} - 16\hat{k}$

(C) $12\hat{i} - 4\hat{j} - 16\hat{k}$

(D) $-12\hat{i} - 9\hat{j} - 16\hat{k}$

65. If $a + \frac{1}{a} = 2\cos\alpha$, then $a^n + \frac{1}{a^n} = ?$

(A) $\cos n\alpha$

(B) $2\cos n\alpha$

(C) $\sin n\alpha$

(D) $2\sin n\alpha$

66. V is finite dimensional vector space and W is a subspace of V. The dimension of $\frac{V}{W}$ is

(A) $\dim V + \dim W$

(B) $\dim V / \dim W$

(C) $\dim V - \dim W$

(D) 2

67. Let V be a vector space of all 2×2 matrices over a field F. The dimension of V is

(A) 2

(B) 4

(C) 6

(D) None of the above

68. Find x and y if

$$(3x - 2iy)(2 + i)^2 = 10(1 + i)$$

(A) $x = \frac{13}{15}, y = \frac{1}{15}$

(B) $x = \frac{14}{15}, y = \frac{4}{13}$

(C) $x = \frac{14}{15}, y = \frac{1}{5}$

(D) $x = \frac{4}{13}, y = \frac{14}{15}$

69. If A and B are coefficients of x^n in the expansion of $(1 + x)^{2n}$ and $(1 + x)^{2n-1}$ respectively, then A/B equals to

(A) 1

(B) 2

(C) 3

(D) 4

70. Find two positive numbers whose sum is 14 and the sum of whose squares is the minimum.

(A) 7, 7

(B) 4, 10

(C) 6, 8

(D) 9, 5

71. Evaluate

$$\iint (x+y)\,dx\,dy$$

over the region bounded by $x \geq 0$, $y \geq 0$, $(x+y) \leq 1$.

(A) 2/3

(B) 1/3

(C) 1

(D) 27

72. The area of the region bounded by parabola $y^2 = 4x$ and its latus rectum is

(A) 4 sq. units

(B) 2/3 sq. unit

(C) 2/5 sq. unit

(D) 8/3 sq. units

73. Solve :

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

(A) $y = x^3 + 2cx$

(B) $x = y^3 + cy$

(C) $y = 2x^2 + 4x + c$

(D) $x = \frac{1}{3}y^3 + \frac{1}{2}y^2 + c$

74. Find the angle between the planes $-x + y + 2z = 9$ and $x + 2y + z = 5$.

(A) 30°

(B) 60°

(C) 90°

(D) 120°

75. Find the characteristic polynomial for the matrix

$$\begin{pmatrix} 1 & 0 & -1 \\ 0 & 1 & 0 \\ 1 & 1 & -1 \end{pmatrix}$$

(A) $(1-\lambda)^2(1+\lambda)$

(B) $(1+\lambda)^2(1-\lambda)$

(C) $\lambda^2(1-\lambda)$

(D) $\lambda^2(1+\lambda)$

76. A researcher records the type of vehicles (car, truck, motorcycle, bus) owned by participants. What scale of measurement is being used?

(A) Nominal

(B) Ordinal

(C) Interval

(D) Ratio

77. A frequency table is primarily used to

(A) display data in a graphical format

(B) calculate the range of data set

(C) summarize the number of occurrences of each value in the data set

(D) calculate the mean

78. What is the mean of the range, mode and median of the data given below?

5, 10, 3, 6, 4, 8, 9, 3,
15, 2, 9, 4, 19, 11, 4

(A) 10

(B) 12

(C) 8

(D) 9

79. In an exclusive type of frequency distribution, the limits excluded are

(A) lower limits

(B) upper limits

(C) either (A) or (B)

(D) both (A) and (B)

80. For open-end class interval, we can calculate only

(A) standard deviation

(B) range

(C) quartile deviation

(D) mean deviation

81. If the arithmetic mean of a series is 10 and its coefficient of variation is 40%, then the variance of the series is

(A) 4

(B) 8

(C) 12

(D) 16

82. In a frequency curve of scores, the mode was found to be higher than the mean. This shows that the distribution is

(A) symmetric

(B) negatively skewed

(C) positively skewed

(D) normal

83. Frequency polygon can be drawn with the help of

(A) bar diagram

(B) histogram

(C) ogive

(D) pie chart

84. Let X be a Poisson variate with parameter λ, $\lambda > 0$, and not an integer. Then which of the following is true?

(A) The mode of the distribution is λ

(B) The distribution is bimodal

(C) The mode of the distribution is the integral part of λ

(D) The mode of the distribution does not exist

85. Events M and N are independent with

$P(M) < P(N)$, $P(M \cap N) = \frac{6}{25}$ and

$P(M \mid N) + P(N \mid M) = 1$

Then the value of $P(M)$ is

(A) 1/5

(B) 2/5

(C) 3/5

(D) 4/5

86. The probability of all possible outcomes of a random experiment is always

(A) equal to 1

(B) equal to 0

(C) lies strictly between 0 and 1

(D) equal to 0·55

87. Laspeyre's price index is 324 and Paasche's price index is 144, then Fisher's ideal index number is

(A) 234

(B) 180

(C) 216

(D) 468

88. When two judges rank two individuals only, the correlation coefficient can assume the values

(A) –1 and 0 only

(B) –1 and +1 only

(C) 0 and +1 only

(D) –1, 0 and +1

89. If the correlation between two variables X and Y is negative, then the regression coefficient of X on Y is

(A) positive

(B) negative

(C) not certain

(D) zero

90. A scatter plot is used to visualize the

(A) relationship between two continuous variables

(B) distribution of a categorical variable

(C) probability density function of a random variable

(D) central tendency of a data set

91. Which test is commonly used to check the overall significance of a linear regression model?

(A) *t*-test

(B) Chi-square test

(C) *z*-test

(D) *F*-test

92. In a country, the total fertility rate is 1·6, and the net reproduction rate is 0·7. What can be inferred about the population of this country if these rates remain constant?

(A) The population will grow rapidly

(B) The population will remain stable

(C) The population will decline over time

(D) The population will double every generation

93. Which of the following components of a time series represents short-term, regular and predictable fluctuations that repeat over a fixed period such as year?

(A) Trend

(B) Cyclical

(C) Seasonal

(D) Irregular

94. If the proportion of M and N is greater than the product of the proportions of M and N separately, the attributes of M and N are said to be

(A) negatively associated

(B) positively associated

(C) inversely associated

(D) independent

95. In the context of an experiment, which term is used to describe the different conditions or procedures applied to the subjects or units under study?

(A) Replication

(B) Pure error

(C) Critical error

(D) Treatment

96. Consider a trial of a criminal. If type I error has occurred in the judgement, then which of the following statements is true?

(A) A guilty person is set free.

(B) An innocent person is convicted.

(C) A guilty person is convicted.

(D) An innocent person is set free.

97. Power of a test is related to

(A) type I error

(B) type II error

(C) both type I and type II error

(D) None of the above

98. In a normal distribution, which of the following statements is always true?

(A) About 60% of the data lies within one standard deviation from the mean.

(B) About 25% of the data lies above the mode.

(C) About 95% of the data lies within two standard deviations from the mean.

(D) About 75% of the data lies within two standard deviations from the mean.

99. In a class, 50% of the students are boys and 50% are girls. If 60% of the boys opted for Statistics and 40% of the girls opted for Statistics, what is the probability that a randomly selected student from the class has opted for Statistics?

(A) 0·5

(B) 0·6

(C) 0·7

(D) 0·4

100. Which of the following is an elementary matrix?

(A) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

(B) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 2 & 0 & 1 \end{pmatrix}$

(C) $\begin{pmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix}$

(D) $\begin{pmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{pmatrix}$

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