

1. The value of $F(s) = L^{-1} \left(\frac{2s^2}{(s^2+1)(s-1)^2} \right)$ is :

(a) $-\cos t + e^{-t} - te^t$

(b) $-\cos t - e^t + te^{-t}$

(c) $\cos t + e^t + te^t$

(d) $-\cos t + e^t + te^t$

2. The solution of the differential equation

$y''' + y'' = e^t + t + 1, y(0) = y'(0) = y''(0) = 0$ is :

(a) $y = \frac{t^3}{6} + t + \frac{e^{2t}}{2} - \frac{e^{-2t}}{2}$

(b) $y = \frac{t^3}{6} - t + \frac{e^t}{2} - \frac{e^{-t}}{2}$

(c) $y = \frac{t^3}{6} - t - \frac{e^t}{2} + \frac{e^{-2t}}{2}$

(d) $y = \frac{t^3}{6} - t + \frac{e^{2t}}{2} - \frac{e^{-t}}{2}$

3. The Fourier series expansion of the function

$f(x) = \begin{cases} x & x \in [0, 1] \\ -x & x \in [-1, 0) \end{cases}$ is :

(a) $f(x) = \frac{1}{2} + \sum_{n=1}^{\infty} \frac{2}{n^2 \pi^2} ((-1)^n - 1) \cos n \pi x$

(b) $f(x) = \frac{1}{2} - \sum_{n=1}^{\infty} \frac{2}{n^2 \pi^2} ((-1)^n + 1) \cos n \pi x$

(c) $f(x) = \frac{1}{2} + \sum_{n=1}^{\infty} \frac{1}{n^2 \pi^2} ((-1)^n + 1) \cos n \pi x$

(d) $f(x) = \frac{1}{2} - \sum_{n=1}^{\infty} \frac{1}{n^2 \pi^2} ((-1)^n - 1) \cos n \pi x$

4. Let f be a scalar-valued function on the set $M_n(F)$ of $n \times n$ matrices. If $f(A) = |A|$ for all $n \times n$ matrices A , then f satisfies which one of the following properties ?

(a) $f(I) \neq 1$

(b) $f(B) = f(A)$ if B is obtained from A by adding a multiple of one row to another

(c) $f(B) = u(f(A))$ if B is obtained from A by interchanging some row by u

(d) $f(B) = -f(A)$ if B is obtained from A by subtracting two rows

5. What is the relative error of $u = \frac{5xy^2}{z^3}$ at $x = y = z = 1$ when the error in each of x, y and z is 0.001 ?

(a) 0.005

(b) 0.015

(c) 0.003

(d) 0.006

$$\frac{5 \times 0.001 \times 0.001 \times 0.001}{0.001 \times 0.001 \times 0.001} = 5$$

$$152.1$$

$$-12 \times 4 = -48$$

6. Suppose that a car is going 76 m/s when brakes are applied at $t = 2$ s. Suppose that the non-constant deceleration is known to be $a = -12t^2$. How much distance does the car travel ?

(a) 81 m

(b) 57 m

(c) 32 m

(d) 43 m

$$a = -12 \times 2^2 = -48$$

7. Consider the following statements regarding linear second-order homogeneous differential equations with constant coefficients:

1. The characteristic equation has complex roots when $b^2 - 4ac < 0$.
2. The characteristic equation has a repeated real root when $b^2 - 4ac > 0$.

Which of the above statements is/are not correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

15

8. A package contains 20 similar components and inspection shows that five have been damaged during transit. If four components are drawn at random from the contents of the package, what is the probability that in this sample exactly one is damaged?

- (a) $\frac{27}{64}$
- (b) $\frac{21}{64}$
- (c) $\frac{11}{64}$
- (d) $\frac{13}{64}$

5C16

64

9. If A is a point with coordinates (5, 4) and B is a point with coordinates (-3, 2), then what is the value of $|\vec{AB}|$?

(a) $\sqrt{68}$

(b) $\sqrt{41}$

(c) $\sqrt{38}$

(d) $\sqrt{62}$

$5 \times 3 = 15 \times 4 \times 2$

A (5, 4)

B (-3, 2)

10. If function f is defined by

$$f(t) = \begin{cases} \sin t, & 0 \leq t \leq \frac{\pi}{4} \\ \sin t + \cos\left(t - \frac{\pi}{4}\right), & t \geq \frac{\pi}{4} \end{cases}$$

then $L\{f(t)\}$ is:

(a) $\frac{1 - e^{-\pi/4}}{s+1}$

(b) $\frac{1 + e^{-\pi/4}}{s^2 + 1}$

(c) $\frac{1 - e^{-\pi/4}}{s^2 + 1}$

(d) $\frac{1 + e^{-\pi/4}}{s^2 + 1}$

11. A geostationary satellite is located approximately :
- (a) 2,230 miles above the equator
 - ☒ (b) 10,000 miles above the equator
 - (c) 22,300 miles above the equator
 - (d) 42,300 miles above the equator
12. The Ku-band communication satellites typically operate at
- (a) Uplink : 6 GHz, Downlink : 4 GHz
 - ☒ (b) Uplink : 8 GHz, Downlink : 6 GHz
 - (c) Uplink : 14 GHz, Downlink : 12 GHz
 - (d) Uplink : 30 GHz, Downlink : 20 GHz
13. Which one of the following is **not** a core human value ?
- (a) Right conduct
 - (b) Truth
 - (c) Non-violence
 - ☒ (d) Simplicity
14. Which one of the following helps the manufacturer, customers and the public, in maintaining competitiveness and ensuring quality simultaneously ?
- (a) Experimentation
 - (b) Balanced outlook on law
 - (c) Competition
 - ☒ (d) Industrial standardization
15. Which one of the following stresses the necessity of rules and regulations in engineering practice ?
- (a) Standardization
 - (b) Experimentation
 - ☒ (c) Balanced outlook on law
 - (d) Competition
16. In which one of the following testing approaches is testing done until the component fails, and it is very expensive, but highly realistic and useful ?
- (a) Prototype testing
 - ☒ (b) Destructive testing
 - (c) Simulation testing
 - (d) Safety-system component testing
17. The analysis in which various parts or components of the system and their modes (patterns, propagation and nature) of failure are studied, is known as :
- ☒ (a) Failure Mode and Effects Analysis
 - (b) Scenario Analysis
 - (c) Fault-tree Analysis
 - (d) Event-tree Analysis

Which one of the following analysis methods is used to combine both hardware failures and human failures?

- (a) Failure Mode and Effects Analysis
- (b) Scenario Analysis
- (c) Fault-tree Analysis
- (d) Event-tree Analysis

The idea of Earth Day was first suggested by:

- (a) John Muir
- (b) Edward Abbey
- (c) Aldo Leopold
- (d) Gaylord Nelson

According to the Brundtland Report, which one of the following is *not* a goal for Sustainable Development?

- (a) Fair distribution of resources to sustain economic development
- (b) More democratic political systems
- (c) Increased use of resources in order to supply the increasing needs of underdeveloped countries
- (d) Population levels that are more compatible with the planet's ecological means

Which one of the following is *not* a type of approach followed in a make-or-buy decision?

- (a) Sales revenue analysis
- (b) Simple cost analysis
- (c) Economic analysis
- (d) Break-even analysis

22. A cumulative delivery schedule graph is associated with:

- (a) Line of Balance
- (b) Assembly Line Balancing
- (c) PERT
- (d) Six Sigma

23. If the annual demand is 600 units, the ordering cost is ₹ 30 per order and the carrying cost is ₹ 10 per unit per year, then the economic order quantity is:

- (a) 60 units
- (b) 43 units
- (c) 14 units
- (d) 20 units

24. What is the relationship between aggregate planning and master production scheduling (MPS)?

- (a) MPS is developed before aggregate planning
- (b) Aggregate planning precedes MPS
- (c) Both are developed simultaneously
- (d) There is no relationship between them

25. The objective of the Computerized Relative Allocation of Facilities Technique (CRAFT) is to:

- (a) Maximize material handling costs
- (b) Minimize material handling costs
- (c) Maximize machine utilization
- (d) Minimize labour costs

26. Which one of the following types of decisions involves product improvement through value analysis?

- ☒ (a) Strategic decision
- ☐ (b) Tactical decision
- (c) Operational decision
- (d) Policy decision

27. The atomic packing factor (APF) of a body-centered cubic (BCC) metallic structure is:

- ☒ (a) $APF = 0.68$
- (b) $APF = 0.74$
- (c) $APF = 0.95$
- (d) $APF = 1$

28. In which one of the following casting methods is a thin slurry, or suspension, of clay in water poured into a porous mould and water is absorbed into the mould wall, causing a layer of clay to form and adhere to it?

- (a) Die casting
- ☒ (b) Centrifugal casting
- (c) Investment casting
- (d) Slip casting

29. Which among the following has the highest specific modulus?

- ☒ (a) Steel
- (b) Silica
- (c) Alumina
- (d) Cement

30. Which one of the following is an important factor in shaping metals by cold working?

- (a) Recrystallization
- (b) Strain hardening
- ☒ (c) Thermal expansion
- (d) Solid solution strength

31. 'Disinformation disseminated by an organization so as to present an environmentally responsible public image' is known as:

- (a) Greenwashing
- (b) Imaging
- ☒ (c) Ecocriticism
- (d) Bootlegging

32. The energy processes in photosynthesis depend on:

- (a) Universal constant
- (b) Velocity of light
- ☒ (c) Photons of solar radiation
- (d) Temperature

33. The kinetic energy of a rotating flywheel is:

- (a) Product of moment of inertia of the flywheel and half of the angular velocity
- (b) One-fourth of the flywheel's angular velocity
- ☒ (c) Half the product of the moment of inertia of the flywheel and the square of its angular velocity
- (d) Product of the mass and concentrated radius of the flywheel

34. Which one of the following is **not** correct in view of the US Soil Taxonomy?

- (a) Histosols – Organic soils; found in bogs and swamps
- (b) Inceptisols – Old soils; often found in dry conditions
- ☒ (c) Entisols – Little or no horizon development; often found in recent flood plains, under recent volcanic ash, as wind-blown sand
- (d) Vertisols – Clay soils that swell when wet; deep cracks appear when dry

35. Which one of the following is **not** a correct pair of an environmental institution in India and its location?

- (a) Wildlife Institute of India – Dehradun
- ☒ (b) Kalpavriksh – Belgaum
- (c) Salim Ali Centre for Ornithology and Natural History – Coimbatore
- (d) World Wide Fund for Nature – New Delhi

36. Ecology is a branch of Biology that primarily deals with the relationship between:

- (a) Plants and animals only
- (b) Soil and water only
- ☒ (c) Living organisms and their environment
- (d) Atmosphere and deserts only

37. Which one of the following is **not** a criterion for defining hazardous waste?

- ☒ (a) Lethality
- (b) Flammability
- (c) Corrosivity
- (d) Reactivity

38. In acid rain, on average, 60% to 70% of the acidity is caused by:

- (a) HCl
- ☒ (b) H_2SO_4
- (c) NH_3
- (d) HNO_3

39. Which one of the following actions best represents the modern approach to cost leadership?

- (a) Reducing employee training expenditure
- (b) Deferring machine replacement
- ☒ (c) Eliminating only non-value-adding activities
- ☒ (d) Reducing vendor development activities

40. In the HMMS (Holt, Modigliani, Muth and Simon) Model, which one of the following mathematical functions is used for different costs?

- (a) Linear functions
- (b) Quadratic functions
- (c) Exponential functions
- ☒ (d) Logarithmic functions

41. The material with the highest modulus of rupture among the following is:

- ☒ (a) Alumina
- ☒ (b) Borosilicate glass
- (c) Steatite
- (d) Mullite

42. Which one of the following transformations occurs when steel is rapidly quenched from the austenitic condition ?

- ☒ (a) Pearlitic transformation
- ☐ (b) Bainitic transformation
- ☒ (c) Martensitic transformation
- ☐ (d) Spheroidite transformation

43. Which one of the following types of bonding is found in materials whose atoms have a small difference in electronegativity ?

- ☐ (a) Metallic bonding
- ☐ (b) Covalent bonding
- ☐ (c) Ionic bonding
- ☒ (d) Secondary bonding

44. Atomic weights of Cu and Si are 63.54 and 28.09 respectively. What is the percentage of Cu in Cu_5Si ?

- ☐ (a) 8.12%
- ☐ (b) 30.66%
- ☐ (c) 69.34%
- ☒ (d) 91.88%

$$\begin{array}{r} 2 \\ 64 \\ \hline 320 \\ \hline 28 \\ \hline 348 \end{array}$$

$$\begin{array}{r} 25 \\ 50 \\ \hline 320 \times 100 \\ \hline 348 \\ \hline 174 \\ 87 \end{array}$$

$$\begin{array}{r} 8000 \\ \hline 87 \end{array}$$

45. The BIOS is stored in :

- ☒ (a) RAM
- ☒ (b) Cache memory
- ☒ (c) ROM
- ☐ (d) Hard disk

46. Wi-Fi products are based on which one of the following IEEE standards ?

- ☐ (a) IEEE 802.3
- ☒ (b) IEEE 802.11
- ☐ (c) IEEE 802.15
- ☐ (d) IEEE 802.16

47. The practice of searching for unsecured Wi-Fi networks while driving around in a car is called :

- ☐ (a) Phishing
- ☐ (b) Packet switching
- ☒ (c) Spoofing
- ☐ (d) War driving

48. Increasing the number of pixels in a digital image primarily improves its :

- ☐ (a) Brightness
- ☒ (b) Resolution
- ☐ (c) Contrast
- ☐ (d) Refresh rate

49. Packet switching shares network resources on a :

- ☒ (a) Dedicated basis
- ☒ (b) Fixed allocation basis
- ☐ (c) Demand basis
- ☐ (d) Permanent basis

50. The spectrum of a real-valued signal exhibits :

- ☐ (a) Circular symmetry
- ☒ (b) Conjugate symmetry
- ☐ (c) Time symmetry
- ☐ (d) Linear symmetry

51. Scientists from which institute have developed a biodegradable nanocarrier platform for targeted gene therapy in breast cancer?

- (a) Indian Institute of Science (IISc), Bengaluru
- ☒ (b) Agharkar Research Institute (ARI), Pune
- (c) National Centre for Cell Science (NCCS), Pune
- (d) Tata Memorial Centre, Mumbai

52. India and South Africa have agreed to strengthen bilateral cooperation primarily in which of the following areas?

- (a) Nuclear energy and defence manufacturing
- ☒ (b) Artificial Intelligence, Digital Infrastructure, and Advanced Manufacturing
- (c) Agriculture and food processing
- (d) Space exploration and fisheries

Which one of the following was *not* identified as a priority area for the next phase of India-South Africa bilateral cooperation in future technologies?

- (a) Artificial Intelligence
- (b) Digital Infrastructure
- (c) Advanced Manufacturing
- ☒ (d) Quantum Computing

54. The Digital India BHASHINI Division (DIBD) signed an MoU with which institution in Nepal?

- (a) Tribhuvan University
- (b) Nepal Academy of Science and Technology (NAST)
- ☒ (c) Kathmandu University's Centre for Digital Public Infrastructure and Artificial Intelligence (DPI-AI)
- (d) Pokhara University

55. The first meeting of the BRICS Science Academies Forum 2026 was convened by:

- (a) NITI Aayog
- ☒ (b) Department of Science and Technology (DST)
- (c) Indian National Science Academy (INSA)
- (d) Council of Scientific and Industrial Research (CSIR)

56. Approximately how far is the spiral galaxy NGC 2139 from Earth?

- (a) 45.3 million light-years
- ☒ (b) 60.2 million light-years
- ☒ (c) 90.7 million light-years
- (d) 120.5 million light-years

57. A Type IIP supernova typically originates from which type of star?

- (a) White dwarf star
- (b) Blue giant star
- (c) Brown dwarf star
- ☒ (d) Red supergiant star

With the support of the IndiaAI Mission, a Government of India initiative, which company has launched 'Varya', a distilled video AI model designed for India?

- (a) Sarvam AI
- (b) Krutrim AI
- (c) Avataar AI
- ☒ (d) Hanooman AI

59. Which state has inaugurated its first semiconductor plant, which is also India's first SME-led semiconductor facility?

- ☒ (a) Gujarat
- (b) Karnataka
- (c) Rajasthan
- (d) Tamil Nadu

60. Under the Great Indian Bustard (GIB) Captive Breeding Programme, two new Great Indian Bustard chicks were hatched at:

- (a) Desert National Park, Jaisalmer
- ☒ (b) Conservation Breeding Centre, Jaisalmer
- (c) National Zoological Park, New Delhi
- ☒ (d) Keoladeo National Park, Bharatpur

61. IREL (India) Limited established a Rare Earth Element recycling plant at the Rare Earth and Titanium Theme Park in:

- ☒ (a) Vijayapura
- (b) Chamoli
- (c) Bhopal
- (d) Kottayam

62. The Ministry of Agriculture & Farmers' Welfare organised a National Workshop on 29th January 2026 on "AgriStack & AI in Agriculture: Now, Next & Beyond" at:

- ☒ (a) New Delhi
- (b) Mumbai
- (c) Chennai
- (d) Kolkata

63. The Department of Telecommunications (DoT) rejected the application from which company for a Unified License (UL) with GMPCS authorization?

- (a) OneWeb India Communications Private Limited
- (b) Jio Satellite Communications Limited
- ☒ (c) Starlink Satellite Communications Private Limited
- (d) Yotta Network Services Private Limited

64. The Indian Navy's First Training Squadron concluded its visit on 28th January 2026 at which of the following sea ports?

- (a) Phuket Deep Sea Port, Thailand
- (b) Port Klang, Malaysia
- ☒ (c) Port of Changi, Singapore
- (d) Yangon Port, Myanmar

65. A project aimed at developing civil aviation infrastructure at Air Force Station Leh was inaugurated on:

- (a) 28th January 2026
- (b) 13th February 2026
- (c) 21st March 2026
- ☒ (d) 21st April 2026

66. The Government of India, aiming to provide tap water connections to all rural households across the country, extended the Jal Jeevan Mission (JJM) 2.0 scheme period up to :

- (a) December 2026
- (b) December 2027
- ☒ (c) December 2028
- (d) December 2030

67. According to the Budget 2026-27, foreign companies providing global cloud services using data centre services in India will be eligible for a tax holiday until :

- ☒ (a) 2035
- (b) 2040
- (c) 2047
- (d) 2050

68. The President of India conferred SOAR certificates on 1st January 2026. What does SOAR stand for ?

- (a) Skill Optimization and AI Research
- (b) Skilling for AI Readiness
- (c) Smart Opportunities for AI Revolution
- ☒ (d) Skill-Oriented Artificial Intelligence Reform

69. The 'Badalta Bharat Mera Anubhav' campaign is aligned with the vision of :

- (a) Digital India 2030
- ☒ (b) Atmanirbhar Bharat 2035
- ☒ (c) Viksit Bharat@2047
- (d) Make in India 2040

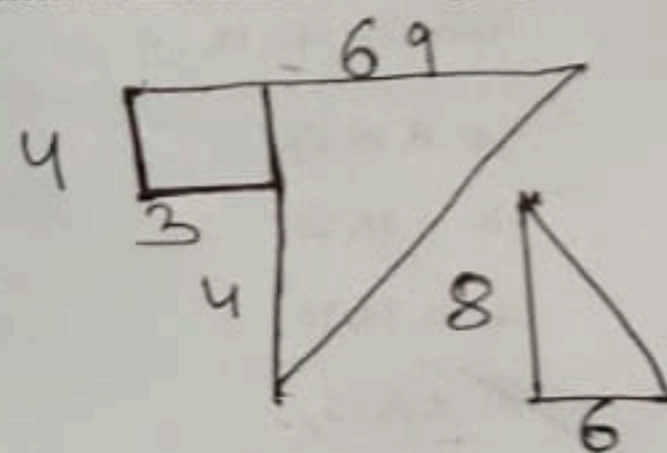
$$\begin{array}{r} 64 \\ 25 \\ \hline 89 \end{array}$$

70. The VYOMA Innovation Challenge has been launched by the Digital India BHASHINI Division (DIBD) in collaboration with which of the following organizations ?

- (a) NITI Aayog and C-DAC
- (b) Current AI and Kalpa Impact
- (c) IndiaAI Mission and NIC
- ☒ (d) ISRO and C-DOT

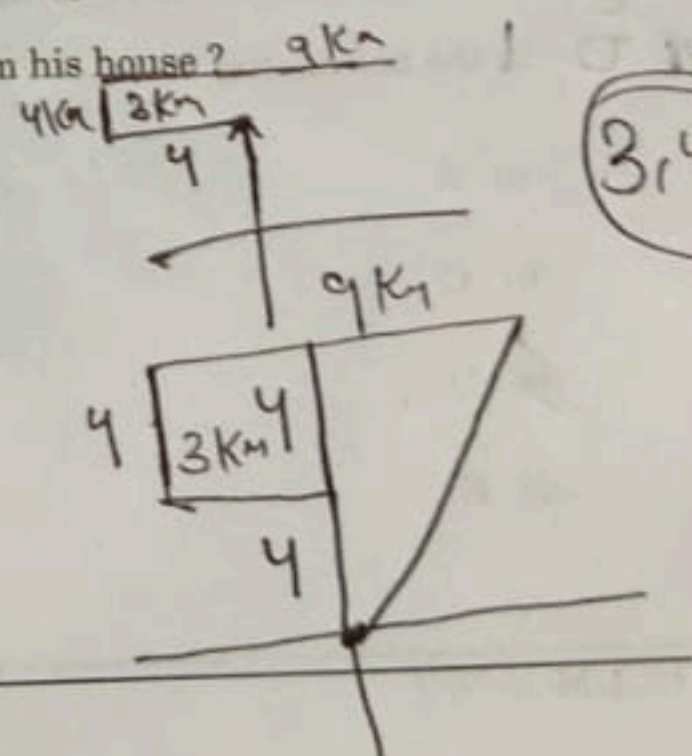
71. If KAVYA is written as PGCGJ, how will ANITA be written in that same code language ?

- ☒ (a) FTPBJ
- (b) FTPJB
- (c) GTBPJ
- (d) ETPCJ

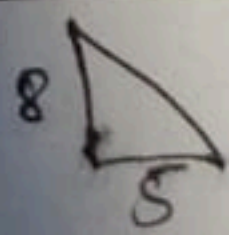


72. A man walks 4 km towards the north from his house and turns to his left to walk 3 km. Again, he turns to his right and walks 4 km. Finally, he turns to his right and walks 9 km. How far is he now from his house ?

- (a) 14 km
- ☒ (b) 10 km
- (c) 9 km
- (d) 8 km



3, 4, 5



52

ishnu can do a work in 10 days and Ram can do the same work in 15 days. In how many days will they complete the work, working together?

- (a) 9 days
- (b) 12 days
- ☒ (c) 6 days
- (d) 8 days

$$\frac{60}{10} = 6$$

$$\frac{60}{15} = 4$$

74. Select the set from the given alternatives which is most similar to the given set.

Given set : (3, 16, 25)

- (a) 6, 36, 64
- (b) 4, 16, 25
- (c) 1, 14, 16
- ☒ (d) 2, 9, 16

75. Six friends A, B, C, D, E and F live in a building tower. A is in the flat below B, and C is in the flat above D. D is in the flat below A, and B lives with E. F lives on the top floor. Who is in the bottom flat?

- (a) A
- (b) C
- ☒ (c) D
- (d) E

F
C
B+E
A
D

76. Pointing to a photograph, Avinash said, "Her grandson Mohan is my brother's nephew." How is the woman in the photograph related to Avinash?

- ☒ (a) Mother
- (b) Sister
- (c) Grandmother
- (d) Niece

MWP → Nila
 MWP → Vidy

77. Nileshe goes for a walk every Monday, Wednesday and Friday and Vicky goes for a walk at the same time every Monday, Thursday, Friday and Saturday. How many times will they meet during the month of October, if the month begins on Thursday?

- (a) 8
- ☒ (b) 9
- (c) 7
- (d) 10

78. In a certain code language "mod to bac" means "water and lemon", "bac soc en" means "orange and tomato" and "en nad toz" means "buy fresh orange". What is the code for "tomato" in the code language?

- ☒ (a) soc
- (b) bac
- (c) en
- (d) nad

79. If the value of each letter is thrice its position number in the English alphabet, then what will be the sum of the values of letters in the word DELNS?

- (a) 183
- (b) 176
- ☒ (c) 171
- (d) 162

30 April 2026

80. The 22nd day of January, 2026 fell on Thursday. What date in the second week of May, 2026 was a Monday?

- (a) 14th
- (b) 12th
- (c) 10th
- ~~(d) 11th~~

81. If a continuous random variable has the

$$\text{density function } f(x) = \begin{cases} \frac{3x^2}{\theta^3}, & 0 \leq x \leq \theta \\ 0, & \text{otherwise} \end{cases}$$

for some $\theta > 0$, then what is the ratio of the mode to the median for this distribution?

- ~~(a) $\sqrt[3]{2}$~~
- (b) $\sqrt[5]{2}$
- (c) $\sqrt[3]{5}$
- (d) $\sqrt[3]{7}$

82. Let the probability that the birth weight (in grams) of babies in America is less than 2547 grams be 0.1. If X equals the number of babies that weigh less than 2547 grams at birth among 20 of these babies selected at random, then what is $P(X \leq 1)$?

- (a) $2.9 \left(\frac{9}{10}\right)^{19}$
- (b) $2.9 \left(\frac{1}{10}\right)^{19}$
- (c) $2.9 \left(\frac{9}{10}\right)^{20}$
- ~~(d) $2.9 \left(\frac{1}{10}\right)^{20}$~~

83. Let X have a Poisson distribution with parameter $\lambda = 1$. What is the probability that $X \geq 2$ given that $X \leq 4$?

- ~~(a) $\frac{65}{98}$~~
- ~~(b) $\frac{24}{65}$~~
- (c) $\frac{17}{24}$
- (d) $\frac{17}{65}$

84. A production department has 35 similar machines. The number of breakdowns on each machine averages 0.06 per week. What is the probability that there will be exactly three machines breaking down in a week?

- ~~(a) $1.5435 e^{-2.1}$~~
- (b) $2.1 e^{-2.1}$
- (c) $2.205 e^{-2.1}$
- (d) $4.305 e^{-2.1}$

85. Twelve balls are distributed at random among three boxes. What is the probability that the first box will contain 3 balls?

- (a) $\frac{220}{27} \left(\frac{2}{3}\right)^9$
- ~~(b) $\frac{22}{270} \left(\frac{2}{3}\right)^9$~~
- (c) $\frac{27}{220} \left(\frac{2}{3}\right)^9$
- (d) $\frac{190}{27} \left(\frac{2}{3}\right)^8$

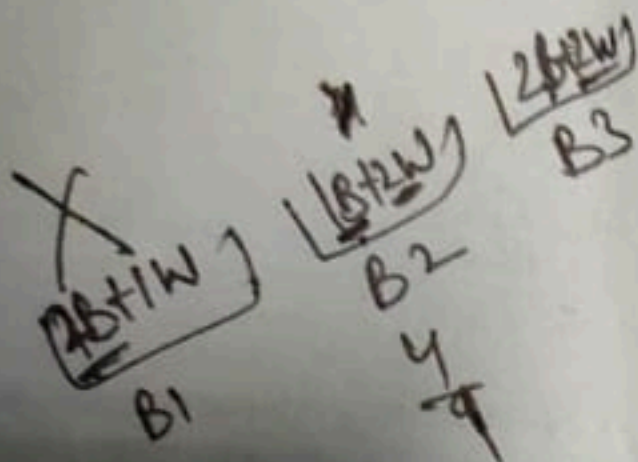
86. Let A and B throw alternately with a pair of ordinary dice. A wins if he throws 6 before B throws 7, and B wins if he throws 7 before A throws 6. If A begins, what is the probability of his winning?

(a) $\frac{5}{36}$

(b) $\frac{31}{36}$

(c) $\frac{30}{61}$

(d) $\frac{5}{16}$



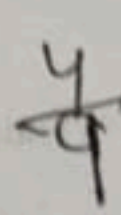
88. Among three boxes, B1 contains 2 black balls and 1 white ball; B2 contains 1 black ball and 2 white balls; and B3 contains 2 black balls and 2 white balls. One of the boxes is selected at random and one ball is drawn, and it turns out to be white. What is the probability of drawing a white ball again, if the first ball is not returned?

(a) $\frac{1}{3}$

(b) $\frac{1}{2}$

(c) $\frac{2}{3}$

(d) $\frac{3}{5}$



87. A slip of paper is given to Sanju who marks it with either a plus sign or a minus sign; the probability of her writing a plus sign is $\frac{1}{3}$. Sanju passes the slip to Asrith, who may either leave it as it is or change the sign before passing it to Nandū. Next, Nandū passes the slip to Priya after perhaps changing the sign. Finally, Priya passes it to a referee after perhaps changing the sign. The referee sees a plus sign on the slip. It is known that Asrith, Nandū and Priya each change the sign with probability $\frac{2}{3}$. What is the probability that Sanju originally wrote a plus sign?

(a) $\frac{13}{27}$

(b) $\frac{8}{27}$

(c) $\frac{13}{41}$

(d) $\frac{18}{41}$

$+ = \frac{2}{3}$
 $- = \frac{1}{3}$

89. The amount of bread (in hundreds of pounds) X that a certain bakery is able to sell in a day is found to be a numerical valued random phenomenon, with the probability density function given below. What is the probability that the number of pounds of bread that will be sold tomorrow is between 250 and 750 pounds?

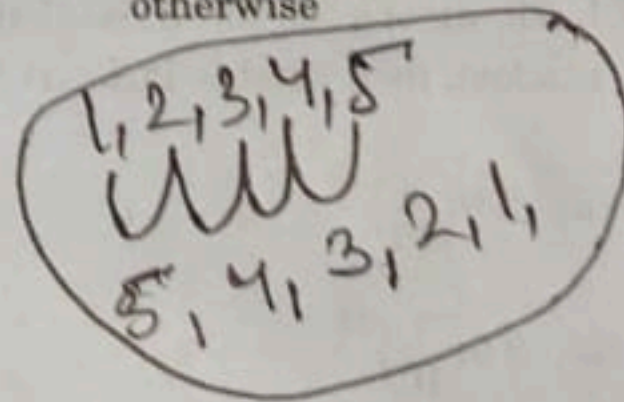
$$f(x) = \begin{cases} Ax & 0 \leq x \leq 5 \\ A(10-x) & 5 \leq x \leq 10 \\ 0 & \text{otherwise} \end{cases}$$

(a) $\frac{1}{2}$

(b) $\frac{3}{8}$

(c) $\frac{3}{4}$

(d) $\frac{3}{5}$



90. A petrol pump is supplied with petrol once a day. Its daily sales volume X in thousands of litres is distributed by $f(x) = 5(1-x)^4$, $0 \leq x \leq 1$. What must be the capacity of its tank in order that the probability that its supply will be exhausted in a given day shall be 0.002?

- (a) 601.9 litres
(b) 714.5 litres
(c) 709.1 litres
(d) 711.5 litres

5

99.9984

91. Ravi and Vishal are ranked 8th and 14th respectively from the top in a class of 33 students. What will be their respective ranks from the bottom in the class?

- (a) 25th and 19th
(b) 26th and 19th
(c) 26th and 20th
(d) 25th and 20th

92. In a cricket tournament, each of the 10 teams will play every other team exactly once. How many matches will be played during the tournament?

- (a) 90
(b) 60
(c) 35
(d) 45

93. Six persons are sitting in a circle facing the centre. F is facing C. C is to the right of B and to the left of D. D is to the left of A. E is to the right of F. Now, D exchanges his seat with E and A exchanges his seat with B. Who is now sitting to the left of C?

- (a) E
(b) B
(c) D
(d) A

Handwritten diagram showing seating arrangement:
Top: A, B, D, E
Bottom: F, C, B, A
Arrows indicate exchanges: A ↔ B, D ↔ E.

94. The radii of two spheres are in the ratio 5 : 3. Their volumes will be in the ratio:

- (a) 27 : 125
(b) 125 : 27
(c) 5 : 3
(d) 25 : 9

Handwritten formula: $\frac{4}{3}\pi r^3$

95. The probability that A speaks the truth is 40% and that B speaks the truth is 30%. What is the percentage of cases in which they are likely to contradict each other while narrating the same incident?

- (a) 16%
- ~~(b) 36%~~
- (c) 46%
- (d) 26%

96. A committee of 3 members is to be selected from a group containing 5 men and 3 women. What is the probability that the committee contains at least 2 women?

(a) $\frac{3}{5}$

~~(b) $\frac{2}{5}$~~

(c) $\frac{3}{9}$

~~(d) $\frac{2}{7}$~~

5 men 3 women

$\frac{3}{8}$

97. What is the probability that a leap year contains 53 Sundays?

~~(a) $\frac{2}{7}$~~

(b) $\frac{5}{7}$

(c) $\frac{3}{7}$

(d) $\frac{2}{9}$

$\frac{365}{53}$

98. What should come in place of the question mark (?) in the following series?

1, 4, ?, 364

(a) 9

(b) 19

(c) 12

~~(d) 17~~

99. If n is an integer between 30 and 90, then any of the following could be $n + 7$, except:

(a) $39 \rightarrow 32 + 7$

(b) $92 \rightarrow 85 + 7$

~~(c) $98 \rightarrow 91 + 7$~~

(d) $88 \rightarrow$

100. If $X + Y + Z = 13$ and X, Y, Z are natural numbers, the maximum value of X will be:

~~(a) 11~~

(b) 9

(c) 13

(d) 10