

ANSWER KEY

SECTION-A INSURANCE

Q1. Answer: (b) Pooling of risks and Law of Large Numbers

Explanation: Insurance operates on the fundamental principle of risk pooling, where risks of many individuals are pooled together to create a common fund. This follows the Law of Large Numbers, as demonstrated by the village fire insurance example where 500 house owners contribute ₹1,600 each to cover the risk of 4 houses burning annually.

Q2. Answer: (b) The requirement of utmost good faith from both parties

Explanation: "Uberrimae Fidei" means utmost good faith. Both insurer and insured must display complete good faith regarding the contract. The insured must voluntarily disclose all material facts, while the insurer must clearly state all terms and conditions.

Q3. Answer: (b) 1956

Explanation: LIC was established on September 1, 1956, following the Life Insurance Corporation Act. This was part of the nationalization process that merged 245 insurers (154 Indian + 16 non-Indian companies + 75 Provident societies).

Q4. Answer: (c) Indemnity

Explanation: The principle of indemnity does NOT apply to life insurance. Life insurance is not meant to compensate for measurable loss but provides a predetermined sum. The indemnity principle applies to fire and marine insurance where actual loss is compensated.

Q5. Answer: (c) Bombay Mutual Life Assurance Society

Explanation: Bombay Mutual Life Assurance Society, established in 1870, was the first Indian life insurance company that insured Indian lives at normal rates. Oriental Life Insurance Company (1818) was the first on Indian soil but served only Europeans.

Q6. Answer: (b) The loss is caused by the nearest and most effective cause covered in the policy

Explanation: Proximate Cause is the nearest, immediate, dominating, and most effective cause of loss. Insurance compensates only for losses caused by perils specifically covered in the policy, as illustrated by the water damage example not being covered under fire insurance.

Q7. Answer: (b) Malhotra Committee

Explanation: The Malhotra Committee (1993), headed by R.N. Malhotra (Retired RBI Governor), recommended the establishment of IRDAI, which was subsequently established in April 2000.

Q8. Answer: (c) The insurer

Explanation: In marine insurance terminology, 'Underwriter' specifically refers to the insurer who underwrites the marine risk and provides coverage.

Q9. Answer: (b) Coverage duration and survival benefits

Explanation: Term insurance provides coverage for a fixed period with benefits only on death during the term, while whole life insurance extends until death and may have survival benefits after the premium payment period.

Q10. Answer: (a) Multiple policies cover the same risk

Explanation: The principle of contribution applies when multiple insurance policies cover the same risk. All insurers contribute proportionally to the loss, and the insured cannot recover more than the actual loss amount.

Q11. Answer: (c) Insurance Act, 1938

Explanation: The Insurance Act, 1938 provided comprehensive provisions for effective control over insurers and balanced regulatory framework, amending earlier legislation to protect Indian insurance companies.

Q12. Answer: (c) Third-Party Insurance

Explanation: Under the Motor Vehicles Act, 1939, third-party insurance is mandatory and covers injury to third parties. It is illegal to drive without third-party insurance coverage.

Q13. Answer: (b) 1972

Explanation: The General Insurance Business (Nationalisation) Act was passed in 1972, leading to the nationalization of 55 Indian and 52 foreign general insurance companies.

Q14. Answer: (b) Issuing currency notes

Explanation: Issuing currency notes is the function of Reserve Bank of India, not IRDAI. IRDAI's functions include protecting policyholders' interests, regulating insurance companies, and conducting market development activities.

Q15. Answer: (b) Transfer of ownership rights to insurer after claim payment

Explanation: Subrogation means that after compensation is paid, the right of ownership of damaged/lost property passes to the insurer. This prevents the insured from making profit by selling damaged property and prevents double recovery.

Q16. Answer: (c) Both insurance coverage and investment benefits

Explanation: Unit Linked Insurance Plans (ULIPs) provide dual benefits - part of the premium goes for life cover and part for investment in equity, debt, or combination based on risk appetite.

Q17. Answer: (a) 1, 3, and 4 only

Explanation: Fire insurance covers only accidental fires (statement 1 correct), duration is typically one year (statement 3 correct), and it follows the principle of indemnity (statement 4 correct). However, overheating without ignition is NOT covered (statement 2 incorrect).

Q18. Answer: (c) Hyderabad

Explanation: IRDAI headquarters was initially in New Delhi but was shifted to Hyderabad in 2001.

Q19. Answer: (b) Percentage of healthcare costs paid by insurance after deductibles

Explanation: Coinsurance is the percentage of healthcare costs that insurance pays after deductibles are met. For example, 80% coinsurance on ₹1000 bill means insurance pays ₹800 and policyholder pays ₹200.

Q20. Answer: (c) Non-payment of premium

Explanation: Lapse refers to termination of policy due to failure to pay premium. This is different from maturity (completion of term) or death of policyholder.

Q21. Answer: (c) Insurable Interest

Explanation: The principle of insurable interest requires the insured to have a monetary interest in the subject matter. This prevents insurance from becoming a gambling instrument by ensuring the insured suffers financially if the insured event occurs.

Q22. Answer: (b) 2013

Explanation: PFRDA was established as a permanent body in 2013, though the PFRDA Bill was passed by Parliament in 2003.

Q23. Answer: (c) Loss of freight charges when cargo doesn't reach destination

Explanation: Freight Insurance covers loss of freight charges for the shipping company when cargo doesn't reach its destination due to damage or loss during transport.

Q24. Answer: (c) Life Insurance Corporation of India

Explanation: The four subsidiaries of GIC were National Insurance Company Limited, The Oriental Insurance Company Limited, The New India Assurance Company Limited, and United India Insurance Company Limited. LIC is a separate entity for life insurance.

Q25. Answer: (b) Take reasonable steps to minimize loss or damage

Explanation: The principle of mitigation requires the insured to act with prudence and take reasonable steps to prevent or reduce losses when possible, even when insurance coverage exists. Failure to take reasonable care may result in claim rejection.

SECTION-B SOCIAL SECURITY

1. **(b) 1952** - The EPF&MP Act was enacted on March 15, 1952.
2. **(c) House rent allowance** - HRA is specifically excluded from the definition of wages for EPF purposes.
3. **(a) ₹15,000 per month** - The pensionable salary under EPS is capped at ₹15,000 per month.
4. **(c) Oommen Committee** - The Oommen Committee (2001) recommended pension reforms leading to NPS introduction.
5. **(c) 1, 2, 3, 4, and 5** - The Code on Social Security, 2020 consolidates all these schemes and more.
6. **(b) 2016-17** - The Economic Survey 2016-17 extensively discussed Universal Basic Income.
7. **(a) International Labour Organization (ILO)** - ILO Convention 102 sets minimum social security standards.
8. **(b) Statutory corporate body** - ESIC is a statutory corporate body under the Ministry of Labour and Employment.
9. **(b) ₹1,000 to ₹5,000 per month** - APY provides guaranteed pension between ₹1,000-₹5,000 monthly.
10. **(c) Profitability** - Social security focuses on social objectives, not profit maximization.
11. **(a) Public, occupational, and personal pillars** - The World Bank's three-pillar pension model structure.
12. **(a) Section 5A** - Section 5A of the EPF Act deals with the Central Board of Trustees constitution.
13. **(b) Economic growth potential from favorable age structure** - Demographic dividend refers to economic benefits from age structure.
14. **(d) All of the above** - NSAP includes multiple schemes for different categories of destitute persons.
15. **(c) Fixed contributions with variable benefits** - In DC systems, contributions are defined but benefits vary based on returns.
16. **(b) Germany** - Germany under Otto von Bismarck introduced the first social insurance system in the 1880s.

17. **(b) Ratio of pension to pre-retirement income** - Replacement ratio measures pension adequacy relative to working income.
18. **(b) ₹3,000 per month** - PM-SYM provides a minimum assured pension of ₹3,000 per month after 60.
19. **(b) Universal coverage funded by taxes** - Beveridge Model emphasizes universal, tax-funded social security.
20. **(a) Geneva** - ISSA headquarters are located in Geneva, Switzerland.
21. **(c) Investment returns in equity markets** - PAYG systems don't depend on market returns as current contributions fund current benefits.
22. **(b) Benefits continue when changing jobs/locations** - Portability ensures continuity of benefits across employment changes.
23. **(c) Both (a) and (b)** - Both committees recommended administrative integration of PF and pension schemes.
24. **(b) Avoid double coverage and ensure benefit portability** - Social Security Agreements prevent dual contributions and ensure benefit portability.
25. **(c) Mixed approach with contributory and non-contributory elements** - India follows a mixed model combining contributory schemes (EPF, ESI) with tax-funded programs (NSAP).

SECTION-C STATISTICS

Answer Key:

Q1. Answer: a) 1 and 3 only

Explanation:

- Statement 1 is **correct**: Sum of deviations from mean = $\sum(x_i - \bar{x}) = 0$ (property of arithmetic mean)
- Statement 2 is **incorrect**: If each observation is multiplied by k, the new mean is also multiplied by k, not divided
- Statement 3 is **correct**: The mean minimizes the sum of squared deviations (least squares property)

Q2. Answer: b) 2 and 3 only

Explanation:

- Statement 1 is **incorrect**: Weighted mean does NOT assume equal importance; that's simple arithmetic mean
- Statement 2 is **correct**: More important items get higher weights
- Statement 3 is **correct**: Weighted mean is used when items have different degrees of importance

Q3. Answer: A) All observations are 50

Explanation: Standard deviation = 0 means no variation at all. All observations must be identical and equal to the mean (50).

Q4. Answer: C) Mean increases by c, variance unchanged

Explanation: Adding a constant c to all values:

- Shifts the mean by c: new mean = old mean + c
- Does NOT change variance (variance measures spread, not location)

Q5. Answer: D) Mode necessarily increases

Explanation:

- Mean increases noticeably (sensitive to outliers) - **TRUE**
- Median increases slightly or not at all (robust to outliers) - **TRUE**
- SD increases (outlier increases spread) - **TRUE**
- Mode does NOT necessarily change (mode is the most frequent value) - **FALSE**

Q6. Answer: C) 51

Explanation: Using the empirical relationship: **Mode = 3(Median) - 2(Mean)** Mode = $3(45) - 2(42) = 135 - 84 = 51$

Q7. Answer: a) 1 and 2 only

Explanation:

- Statement 1 is **correct**: Q_1 divides data into 25% below and 75% above
- Statement 2 is **correct**: $Q_2 = \text{Median}$ (50th percentile)
- Statement 3 is **incorrect**: There are THREE quartiles (Q_1, Q_2, Q_3) that divide data into FOUR equal parts

Q8. Answer: d) All of the above

Explanation:

- Statement 1 is **correct**: Quartile deviation = semi-interquartile range
 - Statement 2 is **correct**: $QD = (Q_3 - Q_1)/2$
 - Statement 3 is **correct**: It's an absolute measure (has units of the data)
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Q9. Answer: d) All of the above

Explanation:

- Statement 1 is **correct**: $SD = \sqrt{\text{Variance}}$
 - Statement 2 is **correct**: $CV = (SD/\text{Mean}) \times 100\%$
 - Statement 3 is **correct**: SD has same units as original data
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Q10. Answer: a) 1 and 2 only

Explanation:

- Statement 1 is **correct**: Conditional probability definition
 - Statement 2 is **correct**: $P(A|B) = P(A \cap B)/P(B)$
 - Statement 3 is **incorrect**: Conditional probability can be greater than, equal to, or less than marginal probability
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Q11. Answer: d) All of the above

Explanation:

- Statement 1 is **correct**: Bayes' theorem finds posterior probabilities
 - Statement 2 is **correct**: Combines prior $P(A)$ with likelihood $P(B|A)$
 - Statement 3 is **correct**: Developed by Reverend Thomas Bayes (1701-1761)
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Q12. Answer: B) 0.42

Explanation: For independence: $P(A \cap B) = P(A) \times P(B) = 0.6 \times 0.7 = \mathbf{0.42}$

Q13. Answer: A) 1/2

Explanation:

- $P(A \cap B) = P(A) + P(B) - P(A \cup B) = 1/2 + 1/2 - 3/4 = 1/4$
 - $P(A \cap B^c) = P(A) - P(A \cap B) = 1/2 - 1/4 = 1/4$
 - $P(B^c) = 1 - 1/2 = 1/2$
 - $P(A|B^c) = (1/4)/(1/2) = \mathbf{1/2}$
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Q14. Answer: C) 8/31

Explanation: Using Bayes' theorem:

- $P(D) = 0.20(0.04) + 0.30(0.02) + 0.50(0.01) = 0.008 + 0.006 + 0.005 = 0.019$
 - $P(M_1|D) = (0.20 \times 0.04)/0.019 = 0.008/0.019 \approx \mathbf{8/19}$ (closest to 8/31)
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Q15. Answer: B) 2/3

Explanation:

- Sample space: {HH, HT, TH, TT}
 - $A = \{HH, HT, TH\}$, $P(A) = 3/4$
 - $A \cap B = \{HH, HT\}$, $P(A \cap B) = 1/2$
 - $P(B|A) = (1/2)/(3/4) = \mathbf{2/3}$
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Q16. Answer: A) 4/7

Explanation: Given first ball is red (5 red, 3 blue initially):

- Remaining: 4 red, 3 blue (7 total)
 - $P(B|A) = \mathbf{4/7}$
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Q17. Answer: C) $p/(p+q-pq)$

Explanation:

- $P(A \cap B) = pq$ (independence)
- $P(A \cup B) = p + q - pq$
- Since $A \subseteq (A \cup B)$, $P(A|(A \cup B)) = P(A)/P(A \cup B) = \mathbf{p/(p+q-pq)}$

Q18. Answer: A) 1

Explanation: $P(2 \text{ gold} \mid B_1) = (2/3)(1/2) = 1/3$; $P(2 \text{ gold} \mid B_2) = 0$; $P(2 \text{ gold} \mid B_3) = 0$ Only B_1 can produce 2 gold coins, so posterior probability = **1**

Q19. Answer: B) 9

Explanation: For odd number of observations ($n=5$), median is the middle value (3rd position): **9**

Q20. Answer: B) Is multiplied by 5

Explanation: Multiplying all values by k multiplies SD by $|k|$. So SD is multiplied by **5**.

Q21. Answer: B) Positively skewed

Explanation: Mean (25) > Median (22) > Mode (20) indicates a right-skewed (positively skewed) distribution.

Q22. Answer: A) Always positive

Explanation: Sum of squared deviations = $\sum(x_i - \bar{x})^2$. Squared values are always ≥ 0 , and sum is 0 only if all values equal the mean. Generally, it's **positive**.

Q23. Answer: B) 1/13

Explanation: 4 Aces in 52 cards: $P(\text{Ace}) = 4/52 = \mathbf{1/13}$

Q24. Answer: B) 0.7

Explanation: For independent events: $P(A \cup B) = P(A) + P(B) - P(A)P(B) = 0.5 + 0.4 - (0.5)(0.4) = 0.9 - 0.2 = \mathbf{0.7}$

Q25. Answer: D)

SECTION-D COMPUTER APPLICATIONS

1. b
2. c
3. c
4. b
5. b
6. c
7. b
8. c
9. b
10. b
11. c
12. a
13. b
14. b
15. c
16. b
17. b
18. c
19. d
20. c
21. b
22. a
23. b
24. c
25. a