

# Sample Exam Paper

## BSCS / BSAI

### Analytical Section

In a class there are seven students (including boys and girls) A, B, C, D, E, F and G. They sit on three benches I, II and III. Such that at least two students on each bench and at least one girl on each bench. C who is a girl student, does not sit with A, E and D. F the boy student sits with only B. A sits on the bench I with his best friends. G sits on the bench III. E is the brother of C.

1. How many girls are there out of these 7 students?

- A: 3
- B: 3 or 4
- C: 4
- D: Data inadequate
- E: None of the above

2. Which of the following is the group of girls?

- A: BGC
- B: BFC
- C: BCD
- D: CDF
- E: None of the above

3. Who sits with C?

- A: B
- B: D
- C: G
- D: E
- E: None of the above

4. On which bench there are three students?

- A: Bench I
- B: Bench II
- C: Bench III
- D: Bench I and Bench II
- E: None of the above

Six scientists A, B, C, D, E, and F are to present a paper each at a one-day conference. Three of them will present their papers in the morning session before the lunch break whereas the other three will be presented in the afternoon session. The lectures have to be scheduled in such a way that they comply with the following restrictions: C should present his paper immediately before B's presentation; their presentations cannot be separated by the lunch break. D must be either the first or the last scientist to present his paper.

5. C could be placed for any of the following places in the order of presenters EXCEPT

- A: first
- B: second
- C: third
- D: fourth
- E: None of above

6. In case F is to present his paper immediately after D presents his paper, B could be scheduled for which of the following places in the order of presenters?

- A: Second
- B: Third
- C: Fourth
- D: Fifth
- E: None of above

7. The original price of a product was PKR 25,200. The product owner increased the price of the product to 110% of its original price to get more money. After two weeks, the product had not sold, so the owner discounted the price by 10%, and the product was finally sold. What price was the product sold for?

- A: PKR 25,200
- B: PKR 25,000
- C: PKR 24,948
- D: PKR 24,544
- E: PKR 23,458

8. Jamal says, "Qasim's mother is the only daughter of my mother", how is Jamal related to Qasim?

- A. Mother
- B. Paternal Uncle
- C. Maternal Uncle
- D. Cousins
- E. Siblings

9. A photocopier can copy  $r$  pages per hour. How many pages can it copy in  $s$  seconds?

- A:  $rs/60$

- B:  $r/6s$
- C:  $s/3600r$
- D:  $rs/3600$
- E:  $3600rs$

10. Which one the following is a correct conclusion from the following statement: "If i go for a walk, it must not be raining"
- A: I do not go for a walk, hence it is not raining.
  - B: It is raining hence I go for a walk for enjoyment.
  - C: It is not raining hence I must have gone for a walk.
  - D: It is raining, hence I did not go for a walk.
  - E: None of the above
11. Today is Monday. After 61 days, will it be?
- A: Wednesday
  - B: Saturday
  - C: Tuesday
  - D: Thursday
  - E: Friday
12. Next term of the sequence 0.02, 0.006, 0.0018, ... is:
- A: 0.0036
  - B: 0.00054
  - C: 0.0052
  - D: 0.00036
  - E: None of the above
13. A bag contains 8 red marbles, 4 blue marbles, and 4 green marbles. 5 balls are drawn without replacement, which of the conclusion is correct?
- A: All 4 blue balls are picked already
  - B: All 4 Green balls are picked already
  - C: The picked balls must have at least 2 blue and 2 green balls.
  - D: The picked balls must contain at least 1 blue and 1 green both.
  - E: None of the above
14. Find the missing number: 1, 2, 6, 24, 120, ?
- A: 350
  - B: 424
  - C: 500
  - D: 720
  - E: None of the above
15. Out of the four words given below, which three can be classified as a group?
- Acceleration
  - Deceleration
  - Speed
  - velocity
- A: 1,2 and 3
  - B: 2,3 and 4
  - C: 1,3 and 4
  - D: 1,2 and 4
  - E: No classification exists
16. In a class of 50 students 10 did not opt for math, 15 did not opt for science and 2 did not opt for either. How many students opted for both math and science?
- A: 24
  - B: 25
  - C: 26
  - D: 27
  - E: None of the above
17. Suppose  $P$  is a prime number bigger than 7. Which of the following expressions must be even?
- A:  $(P + 2)^2$
  - B:  $P^2 + 2$
  - C:  $P(P + 2)$
  - D:  $(P + 1)(P + 2)$
  - E:  $(P - 2)^2$
18. The clock (without numbers) reads 6 : 30. If the clock is reflected in a mirror, what time will be displayed?
- A: 5 : 30
  - B: 6 : 30
  - C: 7 : 30
  - D: 8 : 30
  - E: None of the above

19. A certain state has license plates showing three numbers and three letters. How many different license plates are possible if the numbers must come before the letters?

- A:  $26^3 \times 10^3$
- B:  $26^3 + 10^3$
- C:  $3^{26} \times 10^3$
- D:  $3 \times 26 + 3 \times 10$
- E: None of the above

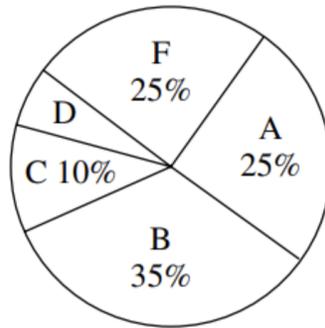
20. What is the approximate distance covered by the orange train in 390 minutes if it moves at the speed of 25km/hr, during this time it makes five station stops to pick up passengers for 4 minutes each?

- A: 188.23km
- B: 162.5km
- C: 154.17km
- D: 150.00km
- E: Not enough information to calculate distance.

### Mathematical Section

Refer to the graph below :

**DISTRIBUTION OF GRADES ON THE FINAL EXAM IN MATH**



21. If 500 students took the exam, how many earned grades of D?

- A: 5
- B: 10
- C: 20
- D: 15
- E: 25

22. What percent of the students who failed the exam would have had to pass it, in order for the percent of students passing the exam to be at least 85%?

- A: 10
- B: 20
- C: 30
- D: 40
- E: 50

A quantity A is directly proportional to square of a quantity B and inversely proportional to a cube of a quantity C,

23. If B is shrunk to half and C expanded to 3 times original size what will the effect on A:

- A: A is expanded by 5 times
- B: A is shrunk by  $1/6$  times
- C: A is expanded by 108 times
- D: A is shrunk by  $1/108$  times
- E: A is unchanged

24. If B is expanded twice and C shrunk twice what will the effect on A:

- A: A is expanded by 2 times
- B: A is shrunk by  $1/2$  times
- C: A is expanded by 4 times
- D: A is shrunk by  $1/6$  times
- E: A is unchanged

25. What is the 11th term of the sequence:  $m - 2n, m - n, m, \dots$ ?

- A.  $m + n$   
 B.  $m - n$   
 C.  $m + 6n$   
 D.  $m + 8n$   
 E.  $m + 4n$
26. What is the result of dividing  $8 + 6i$  by  $2 + i$ ?  
 A:  $4 + 5i$   
 B:  $3 + 4i$   
 C:  $2 + 3i$   
 D:  $1 + 2i$   
 E: None of the above
27. Given the hypotenuse and one side of a right-angled triangle as 50 m and 30 m, respectively, find the length of the other side.  
 A: 40m  
 B: 20m  
 C: 25m  
 D: 35m  
 E: 15m
28. How many different outcomes are possible when a fair die is thrown twice? Recall that a die has six possible outcomes.  
 A: 36  
 B: 12  
 C: 18  
 D: 24  
 E: 6
29. If  $A = \begin{bmatrix} i & -1 \\ -1 & -i \end{bmatrix}$ , then determinant of A is given by  
 A: 4  
 B: 3  
 C: 2  
 D: 1  
 E: 0
30. Which of the following gives the right inequality for AM, GM, HM (arithmetic, geometric, and harmonic means)?  
 A.  $AM \geq HM \geq GM$   
 B.  $GM \geq AM \geq HM$   
 C.  $AM = GM = HM$   
 D.  $GM \geq HM \geq AM$   
 E.  $AM \geq GM \geq HM$
31. A line with equation  $y = 4x - 3$  is rotated 90 degrees counterclockwise about the origin. The equation of the image line is  
 A:  $x = -4y - 3$   
 B:  $x = -4y + 3$   
 C:  $x = 4y - 3$   
 D:  $x = 4y + 3$   
 E:  $x = 3y - 4$
32. If  $A$ ,  $B$  and  $C$  be three sets such that  $A \cup B = A \cup C$  and  $A \cap B = A \cap C$ , then?  
 A:  $B=C$   
 B:  $A=C$   
 C:  $A=B=C$   
 D:  $A=B$   
 E: None of the above
33. What is the magnitude of the vector  $v = (4, -3, 6)$ ?  
 A: 7  
 B: 10  
 C:  $\sqrt{61}$   
 D:  $\sqrt{34}$   
 E: None of the above
34. How many permutations of an  $n$ -element set are there?  
 A:  $n$   
 B:  $n!$   
 C:  $n \times (n-1)$   
 D:  $(n - 1)!$   
 E: None of the above
35. If  $A = \{5, 6, 7\}$  and  $B = \{7, 8, 9\}$  then  $A \cup B$  is equal to ?  
 A:  $\{7\}$

- B: {5, 6, 7, 8, 9}
- C: {7, 8, 9}
- D: {5, 6, 7}
- E: None of the above

36. Which of the following is a proper subset of the set  $A = \{1, 2, 3\}$ ?

- A: {1, 3}
- B: {1, 2, 3}
- C: {2, 3, 4}
- D: {1, 2, 3, 4}
- E: None of the above

37. Earth moves at a speed of 30km/s around the sun. If a rocket travels at this speed for 24 hours how much distance will it cover?

- A: 30,000 km
- B: 2,592,000 km
- C: 108,000 km
- D: 530,100 km
- E: None of the above

38. Two dice are thrown simultaneously then the probability that the sum of the dots of the dice is equal to 4 is:

- A: 1/12
- B: 1/9
- C: 1/2
- D: 1/4
- E: None of the above

39. The eight term in the series 2, 6, 18, 54, is:

- A: 4372
- B: 4375
- C: 4374
- D: 4378
- E: None of the above

40. Write down the next term of the following sequence: 17, 25, 33, 41, 49...?

- A:32
- B:47
- C:55
- D:57
- E:None of the above

41. If we increase a quantity by a

- A: a% increase followed by b% increase will be equal to (a+b)% increase together.
- B: a% increase followed by b% increase will be greater than (a+b)% increase together.
- C: a% increase followed by b% increase will be smaller than (a+b)% increase together.
- D: Cannot be determined as it depends upon the actual value that is increased .

42. The line  $2x - 3y = 6$  intersects the y-axis at the point  $(0, b)$ . The value of  $b$  is

- A: -2
- B: -3
- C: 2
- D: 3
- E: 6

43. If  $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ , then  $14 \times A^{-1}$  is given by

- A:  $\begin{bmatrix} 2 & 14 \\ 2 & 48 \end{bmatrix}$
- B:  $\begin{bmatrix} 4 & -2 \\ 2 & 6 \end{bmatrix}$
- C:  $2 \times \begin{bmatrix} 4 & -2 \\ 2 & 6 \end{bmatrix}$
- D:  $\begin{bmatrix} 21 & 7 \\ -1 & 14 \end{bmatrix}$
- E: None of the above

44. Some scientist claims that 75% of a newly discovered planet kohkafius is pure carbon. Given that the carbon content is estimated at  $15 \times 10^7$  kg, how much is the total mass of kohkafius?

- A:  $20 \times 10^6$  kg
- B:  $75 \times 10^6$  kg
- C:  $200 \times 10^6$  kg
- D:  $2000 \times 10^6$  kg
- E:  $2150 \times 10^7$  kg

45. Which of the following condition is true for equal vectors?  
 A. They have the same direction but not same magnitude  
 B. They have the same magnitude and direction  
 C. They have the same initial point  
 D. They are parallel to the same line  
 E. None of the Above
46. Which number should come next in the series, 48, 24, 12, ?  
 A: 8  
 B: 6  
 C: 4  
 D: 2  
 E: None of the above
47. What is the intersection of sets  $A = \{1, 2, 3\}$  and  $B = \{2, 3, 4\}$ ?  
 A:  $\{1\}$   
 B:  $\{2, 3\}$   
 C:  $\{2, 3, 4\}$   
 D:  $\{1, 2, 3, 4\}$   
 E: None of the above
48. The sum of the series  $5 + 9 + 13 + \dots + 49$  is:  
 A. 435  
 B. 535  
 C. 331  
 D. 324  
 E. 344
49. What is the complement of the set  $A = \{a, b, c\}$  with respect to the universal set  $U = \{a, b, c, d, e\}$ ?  
 A:  $\{d, e\}$   
 B:  $\{a, b, c, d, e\}$   
 C:  $\{a, b, c\}$   
 D:  $\{a, b, c, d\}$   
 E: None of the above
50. C, E, I, K, O, Q, ?  
 A: R  
 B: S  
 C: T  
 D: U  
 E: None of the above
51. The average of 20 numbers is zero. Of them, at the most, how many may be greater than zero?  
 A: 0  
 B: 1  
 C: 10  
 D: 19  
 E: 20
52. Two people are selected at random from the group of 10 people of which 40% have blue eyes. The probability that none of them will have blue eyes?  
 A: 0.4  
 B: 0.33  
 C: 0.6  
 D: 0.36  
 E: None of above
53. If  $A = \begin{bmatrix} -\sin x & -1 \\ 1 & \sin x \end{bmatrix}$ , then determinant of the matrix is given by  
 A:  $\cos^2 x$   
 B:  $-\cos^2 x$   
 C:  $\cos 2x$   
 D:  $\sin 2x$   
 E: None of the above
54. In a drum there was a total of 250 liters of orange juice. Sarah drank  $1/5th$  of the total orange juice. Imran and Saba decided to divide the remaining into half and half. How much of the juice was drunk by Imran.  
 A: 100  
 B: 75  
 C: 50  
 D: 200  
 E: 125

55. Which number comes next? 5, 10, 6, 11, 7, 12, 8, 13, ?  
A: 12  
B: 11  
C: 10  
D: 9  
E: None of the above
56. How many different ways can 5 people be arranged in a line?  
A: 20  
B: 60  
C: 120  
D: 240  
E: None of the above
57. A school cafeteria serves four types of drinks, three types of sandwiches, and two types of salads. How many lunch combinations can the options offer?  
A: 24  
B: 12  
C: 9  
D: 8  
E: 6
58. The ratio between the perimeter and the height of a rectangle is 5 : 1. If the area of the rectangle is 216 sq. cm, what is the width of the rectangle?  
A: 16cm  
B: 18cm  
C: 24cm  
D: 20cm  
E: Data Inadequate
59. Given the data [26.0, 29.0, 43.0, 46.0, 50.0, 55.0, 59.0], what is the mean value?  
A: 308.0  
B: 44.0  
C: 46.0  
D: 303.0  
E: 59.0
60. A ladder is leaning against a wall. The length of the ladder is 10 meters, and the distance between the base of the ladder and the wall is 8 meters. What is the height at which the ladder touches the wall?  
A: 6 meters  
B: 7 meters  
C: 8 meters  
D: 9 meters  
E: 10 meters