

**HOLIDAYS HOMEWORK – 2020-21**  
**CLASS XII**  
**COMPUTER SCIENCE**

**REVISION OF CLASS 11**

1. What will be the output of the following code?

```
dict = {}  
dict[1] = 11  
dict['1'] = 20  
dict[1] = dict[1] + 1  
count = 0  
for i in dict:  
    count += dict[i]  
print(count)
```

2. What will be the output of the following code?

```
dict = {1:'X', 2:'Y', 3:'Z'}  
del dict[1]  
dict[1] = 'D'  
del dict[2]  
print(len(dict))
```

3. What is the output of the following code?

```
dict={1:'dict',2:'B',3:'C'}  
for i,j in dict.items():  
    print(i,j,end=' ')  
numbers={1:5,2:22}  
letters={3:'B'}  
comb={}
```

```
comb['numbers'] = numbers
```

```
comb['letters'] = letters
```

```
print(comb)
```

**4. What will be the output of the following code snippet?**

```
dict = {'Name' : 'Python'}
```

```
id1 = id(dict)
```

```
del dict
```

```
dict = {'Name' : 'Python'}
```

```
id2 = id(dict)
```

```
print(id1 == id2)
```

**5. Given the following dictionary:**

```
inventory = {
```

```
'gold' : 500,
```

```
'pouch' : ['twine', 'gemstone'],
```

```
}
```

**Try to do the followings:**

\*Add a key to inventory called 'packet'

\*Set the value of 'packet' to 'seashell', 'strange berry'

\*sort() the items in the list stored under the 'pouch' key

**6. Write definition of a method/function AddOddEven(VALUE) to display sum of odd and even values separately from the list of VALUES.**

For example,

If the VALUES contain [15,26,37,10,22,13], The function should display

Even Sum: 58

Odd Sum: 65

## FUNCTIONS

1. Write the output of the following code?

```
def myfunc(a, b=5, c=10):  
    print('a is', a, 'and b is', b, 'and c is', c)  
  
myfunc(3, 7)  
  
myfunc(25, c = 24)  
  
myfunc(c = 50, a = 10)
```

2. Write the output of the following code?

```
x = 150  
  
def myfunc():  
    global x  
    print('x is', x)  
  
    x=2  
    print('Changed global x to', x)  
  
myfunc()  
  
print('Value of x is', x)
```

3. Write the output of the following statements.

- print("xyz DEF".capitalize( ))
- print('\*', "python".center(7), '\*')
- print("aaybcbzxcxyy".count('yy'))
- print("Hello {0} and {1}".format('python', 'java'))
- print('while'.isidentifier())
- print('5.1'.isnumeric())

## DATA FILE HANDLING

1. What Will Be the Output of the Following Code Snippet?

```
fo = open("myfile.txt", "w+")  
  
#name gives the name of the file linked with fo  
  
print ("File name is : ", fo.name)
```

```
seq="File handling is easy in python"
```

```
fo.writelines(seq)
```

```
fo.seek(0,0)
```

```
for line in fo:
```

```
    print (line)
```

```
fo.close()
```

**2. Observe the following code and answer the questions that follow:**

```
File = open("Mydata","a")
```

```
_____ #Blank1
```

```
File.close( )
```

i. What type (Text/Binary) of file is Mydata?

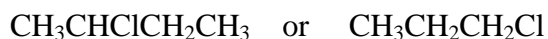
ii. Fill the Blank 1 with statement to write "ABC" in the file "Mydata"

3. Write a Python Program to Count the Number of Blank Spaces in a Text File.
4. Write a Python Program to Read a File and Capitalize the First Letter of Every Word in the File.
5. Write a Python Program to Read the Contents of a File in Reverse Order.
6. Write a function in Python to search and display details of all those students, whose stream is "HUMANITIES" from pickled file "Student.dat". Assuming the pickled file containing following data for the students:-  
Roll, Name, Stream, Percent
7. Write a function MULTIPLEX( ) in python to search and delete all the content in a pickled file CINEMA.DAT, where MTYPE is matching with the value 'Comedy'. File contains following details about Movies – (MNO,MNAME, MTYPE)

## Holiday Homework Class XII Chemistry

### Haloalkenes and Haloarenes

1. Write the structures of the following organic halogen compounds. (i) 2-Chloro-3-methylpentane (ii) p-Bromochlorobenzene
2. What are ambident nucleophiles? Explain with an example.
3. Which compound in each of the following pairs will react faster in SN2 reaction with –OH? (i) CH3Br or CH3I (ii) (CH3)3CCl or CH3Cl
4. Write the mechanism of the following reaction:  $n\text{BuBr} + \text{KCN} \rightarrow n\text{BuCN}$
5. Out of C6H5CH2Cl and C6H5CHClC6H5, which is more easily hydrolysed by aqueous KOH?
6. What happens when (i) n-butyl chloride is treated with alcoholic KOH, (ii) bromobenzene is treated with Mg in the presence of dry ether.
7. What are: (i) Enantiomers (ii) Racemic Mixture.
8. Which one of the following compound is more easily hydrolysed by KOH and why?



9. Give reasons -

- (a) Allyl chloride is hydrolysed more readily than n-propyl chloride.
- (b) Vinyl chloride is hydrolysed more slowly than ethyl chloride.
- (c) Ethyl iodide undergoes SN<sup>2</sup> reaction faster than ethyl Bromide.
- (d) (±) 2-butanol is optically inactive.

10. An optically active compounds having molecular formula C<sub>7</sub>H<sub>15</sub>Br reacts with aqueous KOH to give a racemic mixture of products. Write the mechanism involved.

11. What happens when –

- (a) Ethyl Chloride is treated with NaI in presence of acetone.
- (b) Chloro benzene is treated with Na metal in presence of dry ether.
- (c) Methyl Chloride is treated with KNO<sub>2</sub>.

12. Distinguish between –

- (a) Ethyl Chloride and Vinyl chloride.
- (b) Chloro benzene and benzyl chloride

13. Arrange the following in order of decreasing boiling point

- (a) n-pentyl chloride, iso-pentyl chloride, neo-pentyl chloride

## Alcohols Phenols and Ethers

1. Explain why propanol has higher boiling point than that of the hydrocarbon, butane?
2. Give the equations of reactions for the preparation of phenol from cumene.
3. Explain the following with an example.
  - (i) Kolbe's reaction.
  - (ii) Reimer-Tiemann reaction.
4. Give equations of the following reactions: (i) Oxidation of propan-1-ol with alkaline  $\text{KMnO}_4$  solution. (ii) Bromine in  $\text{CS}_2$  with phenol.
5. How are the following conversions carried out? (i) Benzyl chloride  $\rightarrow$  Benzyl alcohol. (ii) Ethyl magnesium chloride  $\rightarrow$  Propan-1-ol.
6. Write the equation of the reaction of hydrogen iodide with: (i) methoxybenzene and (ii) benzyl ethyl ether.
7. Write equations of the following reactions: (i) Friedel-Crafts reaction – alkylation of anisole. (ii) Nitration of anisole.

## Solutions

1. An aqueous solution of 2% non-volatile solute exerts a pressure of 1.004 bar at the normal boiling point of the solvent. What is the molar mass of the solute?
2. Heptane and octane form an ideal solution. At 373 K, the vapour pressures of the two liquid components are 105.2 kPa and 46.8 kPa respectively. What will be the vapour pressure of a mixture of 26.0 g of heptane and 35 g of octane?
3. The vapour pressure of water is 12.3 kPa at 300 K. Calculate vapour pressure of 1 molal solution of a non-volatile solute in it.
4. Calculate the mass of a non-volatile solute (molar mass 40  $\text{g mol}^{-1}$ ) which should be dissolved in 114 g octane to reduce its vapour pressure to 80%.
5. A solution containing 30 g of non-volatile solute exactly in 90 g of water has a vapour pressure of 2.8 kPa at 298 K. Further, 18 g of water is then added to the solution and the new vapour pressure becomes 2.9 kPa at 298 K. Calculate: (i) molar mass of the solute (ii) vapour pressure of water at 298 K.
6. A 5% solution (by mass) of cane sugar in water has freezing point of 271 K. Calculate the freezing point of 5% glucose in water if freezing point of pure water is 273.15 K.

## CHAPTER 12

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### LINEAR PROGRAMMING

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#### POINTS TO REMEMBER

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- Linear programming is the process used to obtain minimum or maximum value of the linear objectives function under known linear constraints.
- **Objective Functions:** Linear function  $z = ax + by$  where  $a$  and  $b$  are constants, which has to be maximized or minimized is called a linear objective function.
- **Constraints:** the linear inequalities or inequations or restrictions on the variables of a linear programming problem.
- **Feasible Region:** It is defined as a set of points which satisfy all the constraints.
- **To Find Feasible Region:** Draw the graph of all the linear in equations and shade common region determined by all the constraints.
- **Feasible Solutions:** Points within and on the boundary of the feasible region represents feasible solutions of the constraints.
- **Optimal Feasible Solution:** Feasible solution which optimizes the objective function is called optimal feasible solution.

#### Long Answer Type Questions (6 Marks)

1. Solve the following L.P.P. graphically

Minimise and maximise

$$z = 3x + 9y$$

Subject to the constraints

$$x + 3y \leq 60$$

$$x + y \geq 10$$

$$x \leq y$$

$$x \geq 0, y \geq 0$$

2. Determine graphically the minimum value of the objective function  $z = -50x + 20y$ , subject to the constraints.

$$2x - y \geq -5$$

$$3x + y \geq 3$$

$$2x - 3y \leq 12$$

$$x \geq 0, \quad y \geq 0$$

3. Two tailors A and B earn Rs. 150 and Rs. 200 per day respectively. A can stitch 6 shirts and 4 pants per day, while B can stitch 10 shirts and 4 pants per day. How many days shall each work if it is desired to produce at least 60 shirts and 32 pants at a minimum labour cost? Solve the problem graphically.
4. There are two types of fertilisers A and B. A consists of 10% nitrogen and 6% phosphoric acid and B consists of 5% nitrogen and 10% phosphoric acid. After testing the soil conditions, a farmer finds that he needs at least 14 kg of nitrogen and 14 kg of phosphoric acid for his crop. If A costs Rs. 6 per kg and B costs Rs. 5 per kg, determine how much of each type of fertiliser should be used so that nutrient requirements are met at minimum cost. What is the minimum cost?
5. A man has Rs. 1500 to purchase two types of shares of two different companies  $S_1$  and  $S_2$ . Market price of one share of  $S_1$  is Rs. 180 and  $S_2$  is Rs 120. He wishes to purchase a maximum of ten shares only. If



one share of type  $S_1$  gives a yield of Rs. 11 and of type  $S_2$  yields Rs. 8 then how much shares of each type must be purchased to get maximum profit? And what will be the maximum profit?

6. A company manufactures two types of lamps say A and B. Both lamps go through a cutter and then a finisher. Lamp A requires 2 hours of the cutter's time and 1 hours of the finisher's time. Lamp B requires 1 hour of cutter's and 2 hours of finisher's time. The cutter has 100 hours and finisher has 80 hours of time available each month. Profit on one lamp A is Rs. 7.00 and on one lamp B is Rs. 13.00. Assuming that he can sell all that he produces, how many of each type of lamps should be manufactured to obtain maximum profit?
7. A dealer wishes to purchase a number of fans and sewing machines. He has only Rs. 5760 to invest and has space for atmost 20 items. A fan and sewing machine cost Rs. 360 and Rs. 240 respectively. He can sell a fan at a profit of Rs. 22 and sewing machine at a profit of Rs. 18. Assuming that he can sell whatever he buys, how should he invest his money to maximise his profit?
8. If a young man rides his motorcycle at 25 km/h, he has to spend Rs. 2 per km on petrol. If he rides at a faster speed of 40 km/h, the petrol cost increase to Rs. 5 per km. He has Rs. 100 to spend on petrol and wishes to cover the maximum distance within one hour. Express this as L.P.P. and then solve it graphically.
9. A producer has 20 and 10 units of labour and capital respectively which he can use to produce two kinds of goods X and Y. To produce one unit of X, 2 units of capital and 1 unit of labour is required. To produce one unit of Y, 3 units of labour and 1 unit of capital is required. If X and

Y are priced at Rs. 80 and Rs. 100 per unit respectively, how should the producer use his resources to maximise the total revenue?

10. A factory owner purchases two types of machines A and B for his factory. The requirements and limitations for the machines are as follows:

| Machine  | Area Occupied | Labour Force | Daily Output(In units) |
|----------|---------------|--------------|------------------------|
| <b>A</b> | 1000 $m^2$    | 12 men       | 50                     |
| <b>B</b> | 1200 $m^2$    | 8 men        | 40                     |

He has maximum area of 7600  $m^2$  available and 72 skilled labourers who can operate both the machines. How many machines of each type should he buy to maximise the daily output?

11. A manufacturer makes two types of cups A and B. Three machines are required to manufacture the cups and the time in minutes required by each in as given below:

| Types of Cup | Machines |    |     |
|--------------|----------|----|-----|
|              | I        | II | III |
| <b>A</b>     | 12       | 18 | 6   |
| <b>B</b>     | 6        | 0  | 9   |

Each machine is available for a maximum period of 6 hours per day. If the profit on each cup A is 75 paise and on B is 50 paise, find how many cups of each type should be manufactures to maximise the profit per day.

12. A company produces two types of belts A and B. Profits on these belts are Rs. 2 and Rs. 1.50 per belt respectively. A belt of type A requires twice as much time as belt of type B. The company can produce at most 1000 belts of type B per day. Material for 800 belts per day is

available. At most 400 buckles for belts of type A and 700 for type B are available per day. How much belts of each type should the company produce so as to maximize the profit?

13. An aeroplane can carry a maximum of 200 passengers. A profit of Rs. 400 is made on each first class ticket and a profit of Rs. 300 is made on each second class ticket. The airline reserves at a least 20 seats for first class. However at least four times as many passengers prefer to travel by second class than by first class. Determine how many tickets of each type must be sold to maximize profit for the airline.
14. A diet for a sick person must contain at least 4000 units of vitamins, 50 units of minerals and 1400 units of calories. Two foods A and B are available at a cost of Rs. 5 and Rs. 4 per unit respectively. One unit of food A contains 200 units of vitamins, 1 unit of minerals and 40 units of calories whereas one unit of food B contains 100 units of vitamins, 2 units of minerals and 40 units of calories. Find what combination of the food A and B should be used to have least cost but it must satisfy the requirements of the sick person.
15. Anil wants to invest at most Rs, 12000 in bonds A and B. According to the rules, he has to invest at least Rs. 2000 in Bond A and at least Rs. 4000 in bond B. If the rate of interest on bond A and B are 8% and 10% per annum respectively, how should he invest this money for maximum interest? Formulate the problem as L.P.P. and solve graphically.

## LINEAR PROGRAMMING

### One Mark Questions

Chose the Correct option for the following MCQ's(Single option is correct).

- Objective Function of a L.P.P. is
  - A constraint
  - A function to be **optimised**
  - A relation between the variables
  - None of these
- The optimal value of the objective function is attained at the points:
  - Given by intersections of equations with axis only
  - Given by intersections of inequations with **x**-axis only
  - Given by corner points of the feasible region
  - None of these
- The solution set of the inequation  $2x + y > 5$  is
  - Open half-plane that contains the origin
  - Open half-plane not containing the origin
  - Whole **xy**-plane except the points lying on the line  $2x + y = 5$
  - None of these
- If the constraints in a liner programming problem are changed, then
  - The problem is to be re-evaluled
  - Solution not defined
  - The objective function has to be modified
  - The change in constraints is ignored

5. Which of the following statements is correct?
- (a) Every L.P.P. admits an optimal solution
  - (b) A L.P.P. admits unique optimal solution
  - (c) If a L.P.P. admits two optimal solutions it has an infinite number of optimal solutions
  - (d) None of these
6. Solution set of inequation  $x \geq 0$  is
- (a) Half-plane on the left of y-axis.
  - (b) Half-plane on the right of y axis excluding the points on y-axis.
  - (c) Half-plane on the right of y-axis including the points on y-axis.
  - (d) None of these
7. Solution set of the inequation  $y \leq 0$  is
- (a) Half-plane below the x-axis **excluding** the points on x-axis
  - (b) Half-plane below the x-axis including the point on x-axis.
  - (c) Half-plane above the x-axis.
  - (d) None of these
8. Regions represented by equations  $x \geq 0, y \geq 0$  is
- (a) first quadrant
  - (b) Second quadrant
  - (c) Third quadrant
  - (d) Fourth quadrant

## Answers

1. Min  $z = 60$  at  $x = 5, y = 5$   
Max  $z = 180$  at the two corner points  $(0, 20)$  and  $(15, 5)$ .
2. No minimum value
3. Minimum cost = Rs. 1350 at 5 days of A and 3 days of B.
4. 100 kg of fertiliser A and 80 kg of fertilisers B; minimum cost Rs. 1000.
5. Maximum Profit = Rs. 95 with 5 shares of each type.
6. Lamps of type A = 40, Lamps of type B = 20.
7. Fan: 8; Sewing machine: 12, Maximum Profit = Rs. 392.
8. At 25 km/h he should travel  $50/3$  km, at 40 km/h,  $40/3$  km. Maximum distance 30 km in 1 hr.
9. X: 2 units; Y: 6 units; Maximum revenue Rs. 760.
10. Type A: 4; Type B: 3
11. Cup A: 15; Cup B: 30
12. Maximum profit Rs. 1300, No. of belts of type A = 200 No. of belts of type B = 600.
13. No. of first class ticket = 40, No. of second class ticket = 160.
14. Food A: 5 units, Food B: 30 units
15. Maximum interest is Rs. 1160 at  $(2000, 10000)$

**LINEAR PROGRAMMING  
ONE MARK QUESTIONS ANSWER**

1. (d)

2. (c)

3. (b)

4. (a)

5. (c)

6. (c)

7. (b)

8. (a)



## CHAPTER 13

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### PROBABILITY

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#### POINTS TO REMEMBER

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- **Conditional Probability:** If A and B are two events associated with any random experiment, then  $P(A/B)$  represents the probability of occurrence of event A knowing that event B has already occurred.

$$P(A/B) = \frac{P(A \cap B)}{P(B)}, P(B) \neq 0$$

$P(B) \neq 0$ , means that the event should not be impossible.

$$P(A \cap B) = P(A \text{ and } B) = P(B) \times P(A/B)$$

- Similarly  $P(A \cap B \cap C) = P(A) \times P(B/A) \times P(C/AB)$

$$P(A/S) = P(A), P(A/A) = 1, P(S/A) = 1, P(A^1/B) = 1 - P(A/B)$$

- **Multiplication Theorem on Probability:** If the event A and B are associated with any random experiment and the occurrence of one depends on the other, then

$$P(A \cap B) = P(A) \times P(B/A) \text{ where } P(A) \neq 0$$

- When the occurrence of one does not depend on the other then these event are said to be independent events.

Here  $P(A/B) = P(A)$  and  $P(B/A) = P(B)$

$$P(A \cap B) = P(A) \times P(B)$$

- **Theorem on total probability:** If  $E_1, E_2, E_3, \dots, E_n$  be a partition of sample space and  $E_1, E_2, \dots, E_n$  all have non-zero probability. A be any event associated with sample space S, which occurs with  $E_1, \text{ or } E_2, \dots, \text{ or } E_n$ , then

$$P(A) = P(E_1) \cdot P(A/E_1) + P(E_2) \cdot P(A/E_2) + \dots + P(E_n) \cdot P(A/E_n)$$



If A & B are independent then (i)  $A \cap B^c$ , (ii)  $A^c \cap B$  & (iii)  $A^c \cap B^c$  are also independent.

- **Bayes' theorem** : Let S be the sample space and  $E_1, E_2, \dots, E_n$  be n mutually exclusive and exhaustive events associated with a random experiment. If A is any event which occurs with  $E_1, \text{ or } E_2 \text{ or } \dots, E_n$ , then

$$P(E_i/A) = \frac{P(E_i)P(A/E_i)}{\sum_{i=1}^n P(E_i)P(A/E_i)}$$

- **Random variable** : It is real valued function whose domain is the sample space of random experiment.
- **Probability distribution** : It is a system of number of random variable (X), such that

|       |          |          |                 |          |
|-------|----------|----------|-----------------|----------|
| X:    | $X_1$    | $X_2$    | $X_3, \dots$    | $X_n$    |
| P(X): | $P(X_1)$ | $P(X_2)$ | $P(X_3), \dots$ | $P(X_n)$ |

Where  $P(x_i) > 0$  and  $\sum_{i=1}^n P(x_i) = 1$

- Mean or expectation of a random variables (X) is denoted by  $E(X)$

$$E(X) = \mu = \sum_{i=1}^n x_i P(x_i)$$

- Variance of X denoted by  $\text{var}(X)$  or  $\sigma_{x^2}$  and

$$\text{Var}(X) = \sigma_{x^2} = \sum_{i=1}^n (x_i - \mu)^2 P(x_i) = \sum_{i=1}^n x_i^2 P(x_i) - \mu^2$$

- The non-negative number  $\sigma_x = \sqrt{\text{var}(X)}$  is called standard deviation of random variable X.

## ONE MARK QUESTIONS

1. Find  $P(A/B)$  if  $P(A) = 0.4$ ,  $P(B) = 0.8$  and  $P(B/A) = 0.6$
2. Find  $P(A \cap B)$  if  $A$  and  $B$  are two events such that  $P(A) = 0.5$ ,  $P(B) = 0.6$  and  $P(A \cup B) = 0.8$
3. A soldier fires three bullets on enemy: The probability that the enemy will be killed by one bullet is 0.7. What is the probability that the enemy is still alive?
4. If  $P(A) = \frac{1}{2}$ ,  $P(B) = \frac{7}{12}$  and  $P(\text{not } A \text{ or not } B) = \frac{1}{4}$ . State whether  $A$  and  $B$  are independent.
5. Three coins are tossed once. Find the probability of getting at least one head.
6. Find  $P(A/B)$ , if  $P(B) = 0.5$  and  $P(A \cap B) = 0.32$
7. An urn contains 6 red and 3 black balls. Two balls are randomly drawn. Let  $x$  presents the number of black balls. What are the possible value of  $x$ ?
8. A die is tossed thrice. Find the probability of getting an even number at least once.
9. Events  $E$  and  $F$  are such that  $P(\text{Not } E \text{ or Not } F) = 0.25$ . State whether  $E$  and  $F$  are mutually exclusive.
10. Out of 30 consecutive integers 2 are chosen at random. Find the probability so that their sum is odd.
11. If event  $A$  and  $B$  are mutually exclusive and exhaustive events and  $P(A) = \frac{1}{3} P(B)$  then Find  $P(A)$ .
12. A natural number  $x$  is chosen at random from the first hundred natural numbers. Find the probability such that  $x + \frac{1}{x} < 2$
13. A long contains 50 tickets numbered 1, 2, 3, ..... 50 of which five are drawn at random and arranged in ascending order of magnitude. ( $x_1 < x_2 < x_3 < x_4 < x_5$ ). What is the probability that  $x_3 = 30$

## TWO MARK QUESTIONS

1. If A and B are two events such that  $P(A) \neq 0$ , then find  $P(B/A)$  if (i) A is a subset of B (ii)  $A \cap B = \phi$
2. A random variable X has the following probability distribution find K.

|             |                |   |                    |   |                    |                |
|-------------|----------------|---|--------------------|---|--------------------|----------------|
| <b>X</b>    | 0              | 1 | 2                  | 3 | 4                  | 5              |
| <b>P(X)</b> | $\frac{1}{15}$ | K | $\frac{15K-2}{15}$ | K | $\frac{15K-1}{15}$ | $\frac{1}{15}$ |

3. If  $P(A) = \frac{1}{2}$ ,  $P(A \cup B) = \frac{3}{5}$ , and  $P(B) = q$  find the value of q if A and B are (i) Mutually exclusive (ii) independent events.
4. If  $P(A) = \frac{3}{10}$ ,  $P(B) = \frac{2}{5}$  and  $P(A \cup B) = \frac{3}{5}$ , then find  $P(B/A) + P(A/B)$
5. A die is rolled if the out come is an even number. What is the probability that it is a prime?
6. If A and B are two-events such that  $P(A) = \frac{1}{4}$ ,  $P(B) = \frac{1}{2}$  and  $P(A \cap B) = \frac{1}{8}$  Find  $P(\text{not A and not B})$ .

7. The probability that atleast one of the two events A and B occurs is 0.6. If A and B occur **simultaneously** with probability 0.3, then evaluate  $P(\bar{A}) + P(\bar{B})$ .
8. Three events A, B and C have probabilities  $\frac{2}{5}, \frac{1}{3}$ , and  $\frac{1}{2}$ , respectively. If  $P(A \cap C) = \frac{1}{5}$  and  $P(B \cap C) = \frac{1}{4}$ , then find the values of  $P(C/B)$  and  $P(A' \cap C')$ .
9. A die, whose faces are marked 1, 2, 3 in red and 4, 5, 6 in green, is tossed. Let A be the event "number obtained is even" and B be the event "number obtained is red". Find if A and B are independent events.
10. An urn contain 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement. What is the probability that both drawn balls are black?
11. Prove that if E and F are independent events, then events E and  $F'$  are also independent.
12. The probability distribution of a discrete random variable X is given below
- |      |               |               |               |                |
|------|---------------|---------------|---------------|----------------|
| x    | 2             | 3             | 4             | 5              |
| P(x) | $\frac{5}{k}$ | $\frac{7}{k}$ | $\frac{9}{k}$ | $\frac{11}{k}$ |
- find the value of K.
13. If  $P(A) = \frac{7}{13}$ ,  $P(B) = \frac{9}{13}$ , and  $P(A \cap B) = \frac{4}{13}$ , then find  $P\left(\frac{A'}{B}\right)$ .
14. In a class XII of a school, 40% of students study mathematics, 30% of the students study Biology and 10% of the class study both Mathematics and Biology. If a student is selected at random from the class, then find the probability that he will be studying Mathematics or Biology.
15. If  $P(A) = 0.4$ ,  $P(B) = 0.8$  and  $P\left(\frac{B}{A}\right) = 0.6$  then find  $P(A \cup B)$ .
16. A die has two faces each with number 1, three faces each with number 2 and one face with number 3. If die is **rolled** once, then determine probability of not getting 3.
17. A coin is tossed 4 times. Find the mean and variance of the probability distribution of the number of tails.
18. There are 25 tickets bearing numbers from 1 to 25 one ticket is drawn at random. Find the probability that the number on it is a multiple of 5 or 6.

## Answers

### ONE MARK QUESTIONS

- |    |                 |     |   |
|----|-----------------|-----|---|
| 1. | 0.3             | 8.  | $\frac{7}{8}$   |
| 2. | $\frac{3}{10}$  | 9.  | Not mutually exclusive                                  |
| 3. | $(0.3)^3$       | 10. | $\frac{15}{29}$   |
| 4. | No              | 11. | $\frac{1}{4}$   |
| 5. | $\frac{7}{8}$   | 12. | 0   |
| 6. | $\frac{16}{25}$ | 13. | $P(E) = \frac{{}^{29}C_2 \cdot {}^{20}C_2}{{}^{50}C_5}$ |
| 7. | 0, 1, and 2.    |     |   |

### TWO MARK QUESTIONS

- |    |  |     |                           |
|----|--|-----|---------------------------|
| 1. | (i) 1 (ii) 0   | 10. | 3/7                       |
| 2. | $K = \frac{4}{15}$   | 11. | –                         |
| 3. | (i) $\frac{1}{10}$ (ii) $\frac{1}{5}$  | 12. | 32                        |
| 4. | $\frac{7}{12}$   | 13. | 5/9                       |
| 5. | $\frac{1}{3}$  | 14. | 0.6                       |
| 6. | $\frac{3}{8}$  | 15. | 0.96                      |
| 7. | 1.1  | 16. | 5/6                       |
| 8. | 3/10   | 17. | Mean = 2 and variance = 1 |
| 9. | A and B are not independent events (s)<br>because $P(A \cap B) \neq P(A) \cdot P(B)$ | 18. | $\frac{9}{25}$            |