Exam Code | Test Booklet Code

Engineering Paper 1

1. The base quantity among the following is

(a) Speed
(b) Weight
(c) Length
(d) Area

Answer: c
Solution

There are seven base quantities, (i) Mass (ii) Length (iii) Time (iv) Current (v) Amount of substance (vi) Luminous intensity (vii) Temperature

2. Which of the following is not a unit of time?

(a) Second
(b) Minute
(c) Hour
(d) Light year

Answer: d
Solution

Light year is the unit of distance. 1 light year = $9.46 \times 10^{15} m$

3. One astronomical unit is a distance equal to

(a) $9.46 \times 10^{15} m$
(b) $1.496 \times 10^{11} m$
(c) $3 \times 10^{8} m$
(d) $3.08 \times 10^{16} m$

Answer: b
Solution

One astronomical unit is the average distance between earth and sun. 1 astronomical unit (AU)=$1.496 \times 10^{11} m$

4. The volume of a cube having sides 1.2 m is appropriately expressed as

(a) $1.728 \times 10^{6} cm^3$
(b) $1.7 \times 10^{6} cm^3$
(c) $1.8 \times 10^{6} cm^3$
(d) $1.73 \times 10^{6} cm^3$

Answer: b
Solution

The volume of cube is

$$v = (1.2cm)^3 = 1.728 \times 10^6 cm^3 \quad l^3$$
$$v \simeq 1.7 \times 10^6$$

. Answer should be reported in minimum number of significant figures

5. Ampere second is a unit of

(a) Current
(b) Charge
(c) Energy
(d) Power

Answer: b
Solution

$$Current \quad I = \frac{q}{t} \Rightarrow q = It$$
$$q = Ampere \quad second$$

So, ampere second is the unit of charge.

6. The most precise reading of the mass of an object, among the following is

(a) 20 g
(b) 20.0 g
(c) 20.01 g
(d) $20 \times 10^{0} g$

Answer: c
Solution

A measurement having more number of decimal places is the one with the most precision. So, 20.01 g is most precise.

7. The most accurate reading of the length of a 6.28 cm long fibre is

(a) 6 cm
(b) 6.5 cm
(c) 5.99 cm
(d) 6.0 cm

Answer: b
Solution

Most accurate reading is the one having minimum error. So,

$$16 - 6.281 = 0.28cm$$
$$16.5 - 6.281 = 0.22cm$$
$$15.99 - 6.281 = 0.29cm$$
$$16.0 - 6.281 = 0.28cm$$

So, second reading is most accurate.

8. Which of the following is a unit that of force?

(a) N m
(b) mN
(c) nm
(d) N s

Answer: b
Solution

$$Nm \rightarrow Unit \quad of \quad torque$$
$$mN \rightarrow Milli \quad newton \Rightarrow 10^{-}$$
$$nm \rightarrow Nano \quad metre$$
$$Ns \rightarrow Unit \quad of \quad momentu$$

9. The total plane angle subtended by a circle at its centre is

(a) π rad
(b) 2π rad
(c) $\frac{2\pi}{3}$ rad
(d) $\frac{\pi}{2}$ rad

Answer: b
Solution

The total plane angle is 360º or 2π rad

10. One unified atomic mass unit represents a mass of magnitude

(a) 10^{-30} kg
(b) 1.66×10^{27} kg
(c) 1.66×10^{-27} kg
(d) 10^{30} kg

Answer: c
Solution

1 amu = 1.66×10^{-27} kg

11. Which of the following does not posses the same dimensions as that of pressure?

(a) Stress
(b) Bulk modulus
(c) Thrust
(d) Energy density

Answer: c

12. The dimensional formula for thermal resistance is

(a) $[ML^2T^{-3}K^{-1}]$
(b) $[ML^2T^{-2}A^{-1}]$
(c) $[ML^2T^{-3}K^{-2}]$
(d) $[M^{-1}L^2T^3K]$

Answer: d

13. The units of length; velocity and force are doubled . Which of the following is the correct change in the other units

(a) Unit of time is doubled
(b) Unit of mass is doubled
(c) Unit of momentum is doubled
(d) Unit of energy is doubled

Answer: c

14. Which one of the following is not the dimensionless quantity?

(a) Plancks constant
(b) Dielectric constant
(c) Solid angle
(d) Strain

Answer: a

15. The dimensions of impulse are equal to that of

(a) force
(b) linear momentum
(c) pressure
(d) angular momentum

Answer: b

16. The dimensions of the ratio of angular to linear momentum is

(a) $[M^0LT^0]$
(b) $[MLT^{-1}]$
(c) $[ML^2T^{-1}]$
(d) $[M^{-1}L^{-1}T^{-1}]$

Answer: a

17. The dimensional representation of specific resistance in terms of charge Q is

(a) $[ML^3T^{-1}Q^{-2}]$
(b) $[ML^2T^{-2}Q^2]$
(c) $[MLT^{-2}Q^{-1}]$
(d) $[ML^2T^{-2}Q^{-1}]$

Answer: a

18. Out of the following four dimensional quantities; which one qualifies to be called a dimensional constant?

(a) Acceleration due to gravity
(b) Surface tension of water
(c) Weight of a standard kilogram mass
(d) The velocity of light in vacuum

Answer: d

19. On measuring electric energy; 1 kWh is equal to

(a) $3.6 \times 10^4 J$
(b) $3.6 \times 10^6 J$
(c) $7.3 \times 10^6 J$
(d) None of these

Answer: b

20. $ML^{-1}T^{-1}$ stand for dimensions of

(a) work
(b) torque
(c) linear momentum
(d) coefficient of viscosity

Answer: a

21. Haemoglobin contains 0.334% of iron by weight. The molecular weight of haemoglobin is approximately 67200. The number of iron atoms at (at weight of Fe is 56) present in one molecule of haemoglobin are

(a) 1
(b) 6
(c) 4
(d) 2

Answer: c

22. If the uncertainty in the position of electron is zero, the uncertainty in its momentum would be

(a) zero
(b) greater than $\frac{h}{4}\pi$
(c) less than $\frac{h}{4}\pi$
(d) infinite

Answer: d
Solution

$$\Delta p = \frac{h}{4\pi\Delta x} = \frac{h}{4\pi \times zero} = \infty \text{ (infinite)}$$

23. What mass of $H_2(g)$ is needed to reduce 192gm.of MoO_3 to metal? [At wt. of Mo=96]

(a) 8gm
(b) 16gm
(c) 32gm
(d) None of these

Answer: a
Solution

Equivalent of $MoO_3 = \frac{M}{6} = \frac{144}{6} = 24$

equivalent of $H_2 : \frac{192}{24} = \frac{W_{H_2}}{1} \Rightarrow W_{H_2} = 8gm$.

24. If $E_1 E_2$; and E_3 represents respectively the kinetic energies of an electron and an alpha particle and a proton each having same de brogfle wavelength then

(a) $E_1 > E_3 > E_2$
(b) $E_2 > E_3 > E_1$
(c) $E_1 > E_2 > E_3$
(d) $E_1 = E_2 = E_3$

Answer: a
Solution

Since K.E. $= \frac{1}{2}mv^2$ and $\lambda = \frac{h}{mv}$.

$\therefore K.E. = \frac{1}{2}m.\frac{h^2}{m^2\lambda^2} = \frac{h^2}{2m\lambda^2}$.As λ is the same.

$\therefore K.E. \propto \frac{1}{m}$

25. The shortest wavelength of the line in hydrogen atomic spectrum of Lyman series when $R_H = 109678cm^{-1}$ is

(a) 1002.7 A^0
(b) 1215.67 A^0
(c) 1127.30 A^0
(d) 911.7 A^0

Answer: a
Solution

$$\overline{\upsilon} = \frac{1}{\lambda} = R_H\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

For Lyman series, $n_1 = 1$ and $n_2 = \infty$

then, $\frac{1}{\lambda} = R_H\left(\frac{1}{(1)^2} - \frac{1}{\infty}\right)$

or, $\lambda = \frac{1}{R_H}$ or $\lambda = \frac{1}{109678}$

$= 911.7 \times 10^{-8} \text{cm} = 911.7 \text{ Å}$

26. The work function of a metal is 5 ev. what is the kinetic energy of the photoelectron ejected from the metal surface if the energy of theincident radiation is 6.2 ev? ($1eV = 1.6 \times 10^{-19} J$)

(a) $6.626 \times 10^{-19} J$
(b) $8.01 \times 10^{-19} J$
(c) $1.92 \times 10^{-18} J$
(d) $8.010 \times 10^{-18} J$

Answer: c
Solution

$K.E. = h\upsilon - h\upsilon_0 = 6.2 - 5.0 = 1.2eV$

$1\text{eV} = 1.6\times10^{-19}\text{ J}$ ·

then $1.2\text{eV} = 1.2\times1.6\times10^{-19}\text{ J}$

$= 1.92\times10^{-19} J$

27. The maximum number of molecules is present in

(a) 15 L of H_2 gas at STP
(b) 5 L of N_2 gas at STP
(c) 0.5 g of H_2 gas
(d) 10 g of O_2 gas

Answer: a
Solution

No. of molecules in different cases
(a) ∵ 22.4 litre at STP contains
$= 6.023\times10^{23}$molecule of H_2
∴ 15 litre at STP contains

$= \frac{15}{22.4}\times6.023\times10^{23}$

(b) ∵ 22.4 litre at STP contains

$= 6.023\times10^{23}$ molecule of N_2

∵ 5 litre at STP contains = $\frac{5}{22.4}\times6.023\times10^{23}$

(c) ∵ 2 gm of $H_2 = 6.023\times10^{23}$ molecules of H_2

∵ 0.5 gm of H2= $\frac{0.5}{2}\times6.023\times10^{23}$

(d) Similarly 10g of O_2 gas

$= \frac{10}{32}\times6.023\times10^{23}$ molecules

Thus (a) will have maximum number of molecules

28. The vapour density of a gas is 11.2 then 11.2 g of this gas at N.T.P. will occupy a volume

(a) 11.2L
(b) 22.4L
(c) 11.2mL
(d) 22.4mL

Answer: a
Solution

Vapour density of any gass occupies a volume of 11.2 litre at N.T.P.

29. Which of the following sets of quantum numbers represents the highest energy of atom?

(a) n=3; 1=0 m=0 s=+1/2
(b) n=3; 1=1 m=1 s=+1/2
(c) n=3; 1=2 m=1 s=+1/2
(d) n=4; 1=0 m=0 s=+1/2

Answer: c
Solution

(a) n=3, $\ell = 0$ means 3s-orbital and n+1=3
(b) n=3, $\ell = 1$ means 3p-orbital n+1=4
(c) n=3, ℓ =2 means 3d-orbital n+1=5
(d) n=4, ℓ =means 4s-orbitl n+1=4
Increasing order of energy among these otbitals is
3s < 3p < 4s < 3d
∴ 3d has highest energy

30. A binary compound of elements X and Y contains 50% of X. If the atomic masses of X and Y are 10 and 20 and the molecular mass of the compound is 120, the molecular formula of the compound is

(a) X_2
(b) X_4Y_2
(c) X_6Y_3
(d) X_3Y_2

Answer: c
Solution

$X \rightarrow \frac{50}{10} = 5 \rightarrow 2$, simple ratio Y $\rightarrow \frac{50}{10} = 2.5 \rightarrow 1$, simple ratio

Empirical formula = X_2Y Emperical formula mass = 40 n = $\frac{120}{40}$ = 3

M.F = $(E.F)_3 = X_6Y_3$

31. The molecular formula of a compound is M_6O_11. If 20g of the compound contains 9g of the metal, atomic mass of the metal is

(a) 40
(b) 36
(c) 28
(d) 24

Answer: d
Solution

Atomic mass of the metal = X 6x/ (6x + 11 x 16) = 9/20 X = (9 x 11 x 16 / 11 x 6) =24

32. Which of the following at STP contains largest number of atoms?

(a) $800cm^3$ of O_2
(b) $500cm^3$ of NH_3
(c) $600cm^3$ of SO_2
(d) $700cm^3$ of O_3

Answer: d
Solution

Number of atoms From A. = $\frac{2\times800}{22400}\times6.022\times10^{23}$ From B. = $\frac{3\times500}{22400}\times6.022\times10^{23}$ FromC. = $\frac{3x600}{22400}x6.022x10^{23}$ FromD. = $\frac{3x700}{22400}x6.022x10^{2}3$

33. At STP, volume of 0.01g of H_2 is the same as that of

(a) 0.22g of CO_2
(b) 0.085g of NH_3
(c) 0.32g of SO_2
(d) all of these

Answer: d
Solution

Volume of 0.01g of H_2 at STP $= \frac{0.01}{2}\times22.414L$ Volume of 0.22g of $CO_2 = \frac{0.22}{44}\times22.414L$ Volume of 0.085g of $NH_3 = \frac{0.085}{17}$ \times 22.414L Volume of 0.32 of $SO_2 = \frac{0.32}{64}\times22.414L$

34. 6.022×10^{20} molecules of urea are present in 100ml of its solution. The concentration of urea solution is

(a) 0.001 M
(b) 0.01 M
(c) 0.02 M
(d) 0.1 M

Answer: b
Solution

No of moles of urea $\frac{6.022\times10^{20}}{6.022\times10^{23}}$ = 0.001mol Concentration of solution = $\frac{W_B}{M_B}\times\frac{1000}{V_{mL}}$ = 0.001mol x $\frac{1000}{100L} = 0.01molL^{-1}$ = 0.01 M

35. No of H_2O molecules in a drop of water weighing 0.05g is:

(a) 1.5×10^{23}
(b) 1.672×10^{21}
(c) 1.5×10^{20}
(d) 6.022×10^{22}

Answer: b
Solution
1.80g of H_2O contain molecules $= 6.022 \times 10^{23}$ 0.05g of H_2O contain molecules $= \frac{(0.05g)}{(18.0g)} \times 6.022 \times 10^{23}$ 1.672×10^{21}
molecules = 1.672×10^{21}

36. Maximum number of electrons in a subshell of an atom is determined by the following

(a) 2l + 1
(b) 4l + 1
(c) $2n^2$
(d) $4l + 2$

Answer: d
Solution
For a given value of l, maximum number of electrons in a subshell = 2(2l + 1) = 4l + 2

37. Bohr's radius for the H -atom (n = 1) is approximately 0.53 Ampere. The radius of the first excited state (n = 2) is

(a) 0.13 A
(b) 1.06 A
(c) 4.77 A
(d) 2.12 A

Answer: d
Solution
The radius of first excited state orbit (n = 2) = 0.53 A x 4 = 2.12 A

38. The following quantum number are possible for how many orbitals? (n = 3, 1 = 2, m = +2)

(a) 1
(b) 2
(c) 3
(d) 4

Answer: a
Solution
m = +2 represents only one orbital

39. The value of Planck's constant is 6.63×10^{-34} Js. The velocity of light is $3.0 \times 10^{8} ms^{-1}$. Which value of closest to the wavelength in nanometers of a quatum of light with frequency of $8 \times 10^{15} s^{-1}$?

(a) 2×10^{-25}
(b) 5×10^{-18}
(c) 4×10^{1}
(d) 3×10^{7}

Answer: c
Solution
According to wave theory $\Lambda = \frac{c}{v} = \frac{(3 \times 10^{8} ms^{-1})}{8 \times 10^{15} s^{-1})} =$
$37.5 \times 10^{-9} m = 37.5mm = 4 \times 10^{1}$

40. Which of the following represents the electron probability function (D)?

(a) $4\pi r dr \Psi^2$
(b) $4\pi r^2 dr \Psi$
(c) $4\pi r^2 dr \Psi^2$
(d) $4\pi r dr \Psi$

Answer: c
Solution
Electron probability function is $4\pi r^2 dr \Psi^2$

41. The range of the function $\sin(\sin^{-1} x + \cos^{-1} x)$, $|x| \le 1$ is

(a) [-1, 1]
(b) [1, -1]
(c) {0)
(d) {1}

Answer: d
Solution
$gof = g\{f(x)\} = g(x^2) = x^2 + 5$

42. Let f: R → R : f(x) = x^2 and g: R → R : g(x) = x + 5 then gof is:

(a) (x+5)
(b) ($x+5^2$)
(c) (x^2+5^2)
(d) (x^2 + 5)

Answer: d
Solution
$R = \{(a, b) : 1 + ab > 0\}$
It is clear that the given relation on S is reflexive, symmetric but not transitive.

43. Let S be the set of all real numbers. Then the relation R = {(a, b) : 1 + ab >0} on S is

(a) reflexive and symmetric but not transitive
(b) reflexive and transitive but not symmetric
(c) symmetric and transitive but not reflexive
(d) reflexive transitive and symmetric
(e) none of these

Answer: a
Solution
$\because \quad N_5 = \{5, 10, 15, 20, 25, 30, 35, \ldots\}$
and $N_7 = \{7, 14, 21, 35, \ldots\}$
$\therefore \quad N_5 \cap N_7 = \{35, 70, \ldots\} = N_{35}$

44. If N_a = {an: n∈ N}, then $N_5 \cap N_7$ is equal to

(a) N_7
(b) N
(c) N_{35}
(d) N_5
(e) N_{12}

Answer: c
Solution
$\because n(A \times B \times C) = n(A) \times n(B) \times n(C)$
$\therefore \quad n(C) = \frac{24}{4 \times 3} = 2$

45. If n(A) = 4, n(B) = 3, n (A✗ B ✗ C) = 24, then n(C) is equal to

(a) 288
(b) 1
(c) 12
(d) 2

Answer: e
Solution
According to question,
$2^m - 2^n = 56$
$2^n (2^{m-n} - 1) = 56$
This is possible only, if $m = 6$ and $n = 3$.

46. Two finite sets have m and n elements respectively. The total number of subsets of first set is 56 more than the total number of subsets of the second set. The values of m and n respectively are

(a) 7, 6
(b) 6, 3
(c) 5, 1
(d) 7, 8
(e) 3, 6

Answer: b
Solution
We have, $f(x) = \sin^{-1}(\log_2 x)$
$\therefore -1 \le \log_2 x \le 1 \qquad (\because -1 \le \sin^{-1} x \le 1)$
$\Rightarrow \quad 2^{-1} \le x \le 2^1$
$\Rightarrow \quad \frac{1}{2} \le x \le 2$
$\therefore$ Domain of the function $= \left\{x : \frac{1}{2} \le x \le 2\right\}$

47. Domain of the function f(x) = $\sin^{-1}(\log_2 x)$ in a set of real numbers is

(a) {x:1≤x≤2}
(b) {x:1≤x≤3}
(c) {x:-1≤x≤2}
(d) {x:½≤x≤2}
(e) {x:-½≤x≤2}

Answer: d
Solution
According to the given condition $2^m - 2^n = 48$
This is possible only when $m = 6$ and $n = 4$.

48. Two finite sets have m and n elements. The number of elements in the power set of first set is 48 more than the total number of elements in the power set of the second set. Then the values of m and n are

(a) 7, 6
(b) 6, 3
(c) 6, 4
(d) 7, 4
(e) 3, 7

Answer: c
Solution

$n(M) = 100,\ n(P) = 70,\ n(C) = 40$
$n(M \cap P) = 30,\ \ n(M \cap C) = 28,$
$n(P \cap C) = 23$ and $n(M \cap P \cap C) = 18$
$\therefore\ n(M \cap P' \cap C') = n[M \cap (P \cup C)']$
$= n(M) - n[M \cap (P \cup C)]$
$= n(M) - [n(M \cap P) + n(M \cap C) - n(M \cap P \cap C)]$
$= 100 - [30 + 28 - 18]$
$= 60$

49. A class has 175 students. The following data shows the number of students opting one or more subjects. Mathematics 100, Physics 70, Chemistry 30, Mathematics and Physics 30, Mathematics and Chemistry 28, Physics and chemistry 23, Mathematics, Physics and Chemistry 18. How many students have offered Mathematics alone?

(a) 35
(b) 48
(c) 60
(d) 22
(e) 30

Answer: c
Solution

$R = \{(a, b) : 1 + ab > 0\}$
It is clear that the given relation on S is reflexive, symmetric but not transitive.

50. Let S be the set of all real numbers. Then the relation R = {(a, b) : 1 + ab >0} on S is

(a) reflexive and symmetric but not transitive
(b) reflexive and transitive but not symmetric
(c) symmetric and transitive but not reflexive
(d) reflexive transitive and symmetric
(e) none of these

Answer: a
Solution

$\because\ N_5 = \{5, 10, 15, 20, 25, 30, 35, \ldots\}$
and $N_7 = \{7, 14, 21, 35, \ldots\}$
$\therefore\ N_5 \cap N_7 = \{35, 70, \ldots\} = N_{35}$

51. If $N_a = \{an: n \in N\}$, then $N_5 \cap N_7$ is equal to

(a) N_7
(b) N
(c) N_{35}
(d) N_5
(e) N_{12}

Answer: c
Solution

$\because n(A \times B \times C) = n(A) \times n(B) \times n(C)$
$\therefore\ n(C) = \frac{24}{4 \times 3} = 2$

52. If n(A) = 4, n(B) = 3, n (A✗ B ✗ C) = 24, then n(C) is equal to

(a) 288
(b) 1
(c) 12
(d) 2

Answer: e
Solution

According to question,
$2^m - 2^n = 56$
$2^n (2^{m-n} - 1) = 56$
This is possible only, if $m = 6$ and $n = 3$.

53. Two finite sets have m and n elements respectively. The total number of subsets of first set is 56 more than the total number of subsets of the second set. The values of m and n respectively are

(a) 7, 6
(b) 6, 3
(c) 5, 1
(d) 7, 8
(e) 3, 6

Answer: b
Solution

The possible sets are $\{\pm 2, \pm 3\}$ and $\{\pm 4, \pm 1\}$; therefore, number of elements in required set is 8.

54. The number of elements in the set $\{(a, b) : 2a^2 + 3b^2 = 35, a, b \in Z\}$, where Z is the set of all integers is

(a) 2
(b) 4
(c) 8
(d) 12
(e) 16

Answer: c
Solution

$\because A = \{2, 3\}, B = \{2, 4\}$ and $C = \{4, 5\}$
$\therefore\ B \cap C = \{4\}$
Hence, $A \times (B \cap C) = \{(2, 4), (3, 4)\}$

55. If A = $\{x : x^2 - 5x + 6 = 0\}$, B = {2, 4}, C = {4, 5} then A × (B∩C) is

(a) {(2,4), (3,4)}
(b) {(4,2), (4,3)}
(c) {(2,4), (3,4), (4,4)}
(d) {(2,3), (3,3), (4,4)}
(e) null set

Answer: a
Solution

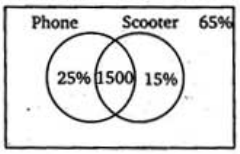
$n(C) = 20,\ n(B) = 50,\ n(C \cap B) = 10$
$\therefore\ n(C \text{ or } B) = n(C \cup B)$
$= n(C) + n(B) - n(C \cap B)$
$= 20 + 50 - 10$
$= 60$ per cent

56. In a city 20% of the population travels by car, 50% travels by bus and 10% travels by both car and bus. The persons traveling by bus or car is

(a) 80%
(b) 40%
(c) 60%
(d) 70%
(e) 30%

Answer: c
Solution

Let the total population of town be x.



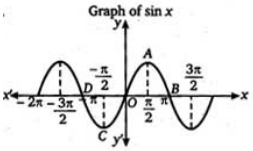
$\therefore\ \frac{25x}{100} + \frac{15x}{100} - 1500 + \frac{65x}{100} = x$
$\Rightarrow\ \frac{105x}{100} - x = 1500$
$\Rightarrow\ \frac{5x}{100} = 1500$
$\Rightarrow\ x = 30000$

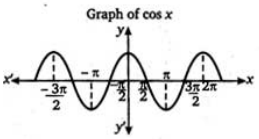
57. In a certain town 25% families own a cell phone, 15% families own a scooter and 65% families own neither a cell phone nor a scooter. If 5000 families own both a cell phone and a scooter, then the total number of families in the town is

(a) 10000
(b) 20000
(c) 30000
(d) 40000
(e) 50000

Answer: c

Solution





In the given options (a), (b), (c) , (e) the curves are decreasing and increasing in the given intervals, so it is not one-to-one function. But in option (d), the curve is only increasing in the given intervals, so it is one-to-one function.

58. Which of the following functions is one to one?

(a) f(x) = sin x, x∈ [-π, π]
(b) f(x) = sin x, x∈ [-3π/2, -π/4]
(c) f(x) = cos x, x∈ [-π/2, π/2]
(d) f(x) = cos x, x∈ [π, 2π]
(e) f(x) = cos x, x∈ [-π/4, π/4]

Answer: d

Solution

Given function is $f(n) = {}^{8-n}P_{n-4}$, $4 \le n \le 6$. It is defined, if

1. $8 - n > 0 \Rightarrow n < 8$ ...(i)
2. $n - 4 \ge 0 \Rightarrow n \ge 4$ ...(ii)
3. $n - 4 \le 8 - n$

$\Rightarrow 2n \le 12 \Rightarrow n \le 6$ ...(iii)

From Eqs. (i), (ii) and (iii), we get

$n = 4, 5, 6$

Hence, range of $f(n) = \{{}^4P_0, {}^3P_1, {}^2P_2\}$

$= \{1, 3, 2\}$

59. Let n be the natural number. Then the range of the function $f(n)={}^{8-n}P_{n-4}$, $4 \le n \le 6$ is

(a) {1, 2, 3, 4}
(b) {1, 2, 3, 4, 5, 6}
(c) {1, 2, 3}
(d) {1, 2, 3, 4, 5}
(e) null

Answer: c

Solution

$\because A$ and B are not disjoint sets .

$\therefore n(A \cup B) = n(A) + n(B) - n(A \cap B)$

60. If A and B are not disjoint sets, then n(A ∪ B) is equal to

(a) n(A) + n(B)
(b) n(A) + n(B) - n(A∩B)
(c) n(A) + n(B) + n(A∩B)
(d) n(A) n(B)
(e) n(A) - n(B)

Answer: b