

# DU MSc Informatics IIC

Topic:- INFO MSC S2\_P1

1) Each of the following idioms has four responses (choices). Choose the correct meaning of the idioms

Mad as a March hare:

[Question ID = 9465]

1. insane  
[Option ID = 37854]
2. intoxicated  
[Option ID = 37855]
3. as mad as I could be  
[Option ID = 37856]
4. slightly touched in the brain  
[Option ID = 37857]

Correct Answer :-

- as mad as I could be  
[Option ID = 37856]

2) Each of the following idioms has four responses (choices). Choose the correct meaning of the idioms

To mince one's words:

[Question ID = 9466]

1. to take back one's word  
[Option ID = 37858]
2. to repeat one's word  
[Option ID = 37859]
3. to speak candidly  
[Option ID = 37860]
4. to speak hesitatingly  
[Option ID = 37861]

Correct Answer :-

- to speak hesitatingly  
[Option ID = 37861]

3) Each of the following idioms has four responses (choices). Choose the correct meaning of the idioms

To have an edge on:

[Question ID = 9467]

1. to cut with a knife  
[Option ID = 37862]
2. to threaten to wound  
[Option ID = 37863]
3. to be slightly better  
[Option ID = 37864]
4. to be in a dangerous situation  
[Option ID = 37865]

Correct Answer :-

- to be slightly better  
[Option ID = 37864]

4) Out of the four alternatives given below, choose the one which is opposite in meaning to the each of the word.

LUSCIOUS

[Question ID = 9468]

1. Dry

[Option ID = 37866]

2. Sour

[Option ID = 37867]

3. Ugly

[Option ID = 37868]

4. Stale

[Option ID = 37869]

**Correct Answer :-**

- Ugly

[Option ID = 37868]

**5) Out of the four alternatives given below, choose the one which is opposite in meaning to the each of the word.**

**ABHOR**

**[Question ID = 9469]**

1. detest

[Option ID = 37870]

2. Condemn

[Option ID = 37871]

3. Love

[Option ID = 37872]

4. Entertain

[Option ID = 37873]

**Correct Answer :-**

- Love

[Option ID = 37872]

**6) Out of the four alternatives given below, choose the one which is opposite in meaning to the each of the word.**

**PARSIMONIOUS**

**[Question ID = 9470]**

1. Generous

[Option ID = 37874]

2. Frugal

[Option ID = 37875]

3. Crude

[Option ID = 37876]

4. Stingy

[Option ID = 37877]

**Correct Answer :-**

- Generous

[Option ID = 37874]

**7) Each of the following items in this section consists of a sentence, the parts of which have been jumbled. These parts have been labelled P, Q, R and S. Given below each sentence are four sequences namely (1), (2), (3) and (4). You are required to rearrange the jumbled parts of the sentence and select the correct sequence.**

**Most of Hitchcock's films**

**were critically acclaimed on both sides of the Atlantic (P)  
earning him both fame and fortune (Q)  
and made good money at the box office, (R)  
in no small measure (S).**

**The correct sequence should be**

**[Question ID = 9471]**

1. PRQS

[Option ID = 37878]

2. PRSQ

[Option ID = 37879]

3. QPRS

[Option ID = 37880]

4. QSPR

[Option ID = 37881]

Correct Answer :-

• PRQS

[Option ID = 37878]

8) Each of the following items in this section consists of a sentence, the parts of which have been jumbled. These parts have been labelled P, Q, R and S. Given below each sentence are four sequences namely (1), (2), (3) and (4). You are required to rearrange the jumbled parts of the sentence and select the correct sequence.

One monsoon evening,

the farmer returned from the fields (P)  
when the sky was overcast with threatening clouds (Q)  
and found a group of children playing on the road (R)  
a little earlier than usual (S).

The correct sequence should be

[Question ID = 9472]

1. QSPR

[Option ID = 37882]

2. QPSR

[Option ID = 37883]

3. QRSP

[Option ID = 37884]

4. PQRS

[Option ID = 37885]

Correct Answer :-

• QPSR

[Option ID = 37883]

9) Each of the following items in this section consists of a sentence, the parts of which have been jumbled. These parts have been labelled P, Q, R and S. Given below each sentence are four sequences namely (1), (2), (3) and (4). You are required to rearrange the jumbled parts of the sentence and select the correct sequence.

It was reported that

The table (P)  
belonging to a lady (Q)  
with three carved legs (R)  
was sold the next day by auction (S),

The correct sequence should be

[Question ID = 9473]

1. PRQS

[Option ID = 37886]

2. QPRS

[Option ID = 37887]

3. PQSR

[Option ID = 37888]

4. PQRS

[Option ID = 37889]

Correct Answer :-

• PQSR

[Option ID = 37888]

10) A particle of mass  $m$  moves under the action of a central force whose potential is  $V(r) = kmr^3 (k > 0)$ , then energy for which the orbit will be a circle of radius  $a$ , about the origin is force field defined by  $\vec{F} = -kr^2/r^4$ . If  $E$  is the total energy supplied to the particle, then its speed is given by

[Question ID = 9474]

1.  $\frac{3}{2}mka^3$

[Option ID = 37890]

2.  $\frac{3}{2}mka^2$

[Option ID = 37891]

3.  $\frac{1}{2}mka$

[Option ID = 37892]

4.  $\frac{1}{2}mka^2$

[Option ID = 37893]

Correct Answer :-

•  $\frac{3}{2}mka^3$

[Option ID = 37890]

11) The equation of motion for a small particle of mass  $m$  is given by  $m\ddot{x} + \gamma\dot{x} - mg = 0$ . Assuming initial speed to be  $v_0$ , the terminal speed of particle will be

[Question ID = 9475]

1.  $\frac{mg}{\gamma}$

[Option ID = 37894]

2.  $\sqrt{v_0 + 2gx}$

[Option ID = 37895]

3.  $v_0 + gt$

[Option ID = 37896]

4.  $\frac{mg}{\gamma^2}t$

[Option ID = 37897]

Correct Answer :-

•  $\frac{mg}{\gamma}$

[Option ID = 37894]

12) A plane wave having the electric field component  $\vec{E}_i = 24\cos(3 \times 10^8t - \beta y)\hat{a}_z$  V/m and travelling in free space is incident normally on a lossless medium with  $\mu = \mu_0$  and  $\epsilon = 9\epsilon_0$  which occupies the region  $y \geq 0$ . Find the reflected magnetic field component.

[Question ID = 9476]

1.  $H_r = \frac{1}{10\pi}\cos(3 \times 10^8t + \beta y)\hat{a}_x$

[Option ID = 37898]

2.  $H_r = \frac{1}{5\pi}\cos(3 \times 10^8t - \beta y)\hat{a}_x$

[Option ID = 37899]

3.  $H_r = \frac{1}{10\pi}\cos(3 \times 10^8t + \beta y)\hat{a}_z$

[Option ID = 37900]

4.  $H_r = \frac{1}{5\pi}\cos(3 \times 10^8t - \beta y)\hat{a}_y$

[Option ID = 37901]

Correct Answer :-

•  $H_r = \frac{1}{10\pi}\cos(3 \times 10^8t + \beta y)\hat{a}_x$

[Option ID = 37898]

13) A particle of mass  $m$  and charge  $q$  moves with a constant velocity  $v$  along the positive  $x$  -direction. It enters a region containing a uniform magnetic field  $B$  directed along the negative  $z$  -direction, extending from  $x = a$  to  $x = b$ . The minimum value of  $v$  required so that the particle can just enter the region  $x > b$  is

[Question ID = 9477]

1.  $\frac{qbB}{m}$

[Option ID = 37902]

2.  $\frac{q(b-a)B}{m}$

[Option ID = 37903]

3.  $\frac{qaB}{m}$

[Option ID = 37904]

4.  $\frac{q(b+a)B}{2m}$

[Option ID = 37905]

Correct Answer :-

•  $\frac{q(b-a)B}{m}$

[Option ID = 37903]

14) The wave function in the ground state of hydrogen atom is given as  $\psi = Ae^{-r/a}$

where  $r$  – measures distance from nucleus and  $a$  is a constant.

The value of  $A$  is

[Question ID = 9478]

1.  $1/\sqrt{\pi a}$

[Option ID = 37906]

2.  $1/\sqrt{\pi a^3}$

[Option ID = 37907]

3.  $\sqrt{\pi a}$

[Option ID = 37908]

4.  $1/\sqrt{\pi a^5}$

[Option ID = 37909]

Correct Answer :-

•  $1/\sqrt{\pi a^3}$

[Option ID = 37907]

15) A particle of mass  $m$  is represented by the wave function  $\psi(x) = Ae^{ikx}$ , where  $k$  is the wave vector and  $A$  is constant.

The magnitude of the probability current density of the particle is

[Question ID = 9479]

1.  $|A|^2 \frac{k\hbar}{m}$

[Option ID = 37910]

2.  $|A|^2 \frac{k\hbar}{2m}$

[Option ID = 37911]

3.  $|A|^2 \frac{k\hbar}{3m}$

[Option ID = 37912]

4.  $|A|^2 \frac{k^2 \hbar}{m}$

[Option ID = 37913]

Correct Answer :-

•  $|A|^2 \frac{k\hbar}{m}$

[Option ID = 37910]

16) A system consists of  $10^{24}$  atoms and is at a temperature of  $300K$ . Assuming that there is no interatomic energy in the system, its total energy is

[Question ID = 9480]

1.  $12.4kJ$

[Option ID = 37914]

2.  $12.4J$

[Option ID = 37915]

3.  $4.12kJ$

[Option ID = 37916]

4.  $4.12J$

[Option ID = 37917]

Correct Answer :-

•  $12.4kJ$

[Option ID = 37914]

17) Two ends of a rod are kept at  $120^\circ C$  and  $227^\circ C$ . When  $2000cal$  of heat flows in this rod, then the change in entropy is

[Question ID = 9481]

1.  $1.0cal/K$

[Option ID = 37918]

2.  $0.7cal/K$

[Option ID = 37919]

3.  $20.0cal/K$

[Option ID = 37920]

4.  $6.9cal/K$

[Option ID = 37921]

Correct Answer :-

•  $20.0cal/K$

[Option ID = 37920]

18) The volume in cylindrical coordinate between  $r = 2\text{ m}$  and  $4\text{ m}$  contains a uniform charge density  $\rho$  ( $C/m^3$ ). The electric flux density  $\vec{D}$  for  $r > 4\text{ m}$

[Question ID = 9482]

1.  $(6\rho/r)\hat{a}_r$

[Option ID = 37922]

2.  $(3\rho/r)\hat{a}_r$

[Option ID = 37923]

3.  $(\rho/3r)\hat{a}_r$

[Option ID = 37924]

4.  $(\rho/6r)\hat{a}_r$

[Option ID = 37925]

Correct Answer :-

•  $(6\rho/r)\hat{a}_r$

[Option ID = 37922]

19) The angle of resultant polarization of an electromagnetic wave whose electric field is given below

$$E_x = 4E_0 \cos(3x + 4y - 500t)$$

$$E_y = 3E_0 \cos(3x + 4y - 500t + \pi)$$

$$E_z = 0$$

[Question ID = 9483]

1.  $\phi = \tan^{-1}\left(\frac{-3}{4}\right)$

[Option ID = 37926]

2.  $\phi = \tan^{-1}\left(\frac{3}{4}\right)$

[Option ID = 37927]

3.  $\phi = \tan^{-1}\left(\frac{-4}{3}\right)$

[Option ID = 37928]

4.  $\phi = \tan^{-1}\left(\frac{4}{3}\right)$

[Option ID = 37929]

Correct Answer :-

•  $\phi = \tan^{-1}\left(\frac{-3}{4}\right)$

[Option ID = 37926]

20) A material at  $300^\circ\text{K}$  has two energy levels having wavelength separation of  $1\mu\text{m}$ . The ratio of upper to lower level occupation densities when the material is in thermal equilibrium is

[Question ID = 9484]

1.  $10^{-12}$

[Option ID = 37930]

2.  $10^{-11}$

[Option ID = 37931]

3.  $10^{-21}$

[Option ID = 37932]

4.  $10^{-22}$

[Option ID = 37933]

Correct Answer :-

•  $10^{-21}$

[Option ID = 37932]

21) For radioactive nucleus, the mean life is  $T$ . If the number of decays per unit time is  $n$  at  $t = 0$ , the number of decays between time 0 and  $t$  is

[Question ID = 9485]

1.  $nTe^{-t/T}$

[Option ID = 37934]

2.  $n(1 - e^{t/T})$

[Option ID = 37935]

3.  $nT(1 - e^{t/T})$

[Option ID = 37936]

4.  $ne^{-t/T}$

[Option ID = 37937]

Correct Answer :-

•  $n(1 - e^{t/T})$

[Option ID = 37935]

22) Solve the differential equation

$$x \frac{dy}{dx} + y \log y = xy e^x$$

[Question ID = 9487]

1.  $x \log y = x e^x + e^x + \text{const.}$

[Option ID = 37942]

2.  $x \log y = x e^x - e^x + \text{const.}$

[Option ID = 37943]

3.  $x \log y = x e^y + e^x + \text{const.}$

[Option ID = 37944]

4.  $x \log y = x e^x + e^y + \text{const.}$

[Option ID = 37945]

Correct Answer :-

•  $x \log y = x e^x - e^x + \text{const.}$

[Option ID = 37943]

23) Solve

$$(D^2 + 6D + 9)y = e^{-3x}/x^3$$

[Question ID = 9488]

1.  $y = (C_1 + C_2 x)e^{-3x} + e^{-3x}/x^3$

[Option ID = 37946]

2.  $y = (C_1 + C_2 x)e^{3x} + e^{-3x}/x^3$

[Option ID = 37947]

3.  $y = (C_1 + C_2 x)e^{3x} + e^{3x}/x^3$

[Option ID = 37948]

4.  $y = (C_1 + C_2 x)e^{-3x} + e^{-3x}/x^4$

[Option ID = 37949]

Correct Answer :-

•  $y = (C_1 + C_2 x)e^{-3x} + e^{-3x}/x^3$

[Option ID = 37946]

24) If  $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$ , then find  $A^{-1}$

[Question ID = 9489]

1.  $A^{-1} = \begin{bmatrix} 1 & -1 & 0 \\ -2 & 3 & -4 \\ -2 & 3 & -3 \end{bmatrix}$

[Option ID = 37950]

2.  $A^{-1} = \begin{bmatrix} 1 & -1 & 0 \\ -2 & 3 & 4 \\ -2 & 3 & -3 \end{bmatrix}$

[Option ID = 37951]

3.  $A^{-1} = \begin{bmatrix} 1 & -1 & 0 \\ -2 & -3 & -4 \\ -2 & 3 & -3 \end{bmatrix}$

[Option ID = 37952]

4.  $A^{-1} = \begin{bmatrix} 1 & -1 & 0 \\ -2 & 3 & -4 \\ 2 & 3 & -3 \end{bmatrix}$

[Option ID = 37953]

Correct Answer :-

•  $A^{-1} = \begin{bmatrix} 1 & -1 & 0 \\ -2 & 3 & -4 \\ -2 & 3 & -3 \end{bmatrix}$

[Option ID = 37950]

25) Find the rank of the matrix

$$A = \begin{bmatrix} 1 & 2 & -1 & 3 \\ 4 & 1 & 2 & 1 \\ 3 & -1 & 1 & 2 \\ 1 & 2 & 0 & 1 \end{bmatrix}$$

[Question ID = 9490]

1. 4 [Option ID = 37954]

2. 1 [Option ID = 37955]

3. 2 [Option ID = 37956]

4. 3 [Option ID = 37957]

Correct Answer :-

- 3 [Option ID = 37957]

26) Write down the matrix of the quadratic form

$$x_1^2 + 2x_2^2 - 7x_3^2 + x_4^2 - 4x_1x_2 + 8x_1x_3 - 6x_3x_4$$

[Question ID = 9491]

1. 
$$\begin{bmatrix} 1 & -2 & 4 & 0 \\ -2 & 2 & 0 & 0 \\ 4 & 0 & -7 & -3 \\ 0 & 0 & -3 & -1 \end{bmatrix}$$

[Option ID = 37958]

2. 
$$\begin{bmatrix} 1 & -2 & 4 & 0 \\ -2 & 2 & 0 & 0 \\ 4 & 0 & -7 & -3 \\ 0 & 0 & -3 & 1 \end{bmatrix}$$

[Option ID = 37959]

3. 
$$\begin{bmatrix} 1 & -2 & 4 & 0 \\ -2 & 2 & 0 & 0 \\ 4 & 0 & -7 & -3 \\ 0 & 1 & -3 & 1 \end{bmatrix}$$

[Option ID = 37960]

4. 
$$\begin{bmatrix} 1 & -2 & 4 & 0 \\ -2 & 2 & 0 & 0 \\ 4 & 0 & -7 & -3 \\ 0 & 0 & 3 & 1 \end{bmatrix}$$

[Option ID = 37961]

Correct Answer :-

- $$\begin{bmatrix} 1 & -2 & 4 & 0 \\ -2 & 2 & 0 & 0 \\ 4 & 0 & -7 & -3 \\ 0 & 0 & -3 & 1 \end{bmatrix}$$

[Option ID = 37959]

27) Let  $A = \begin{bmatrix} 4 & 1 & 0 \\ 1 & 4 & 1 \\ 0 & 1 & 4 \end{bmatrix}$ . Find matrix  $P$  such that  $P^{-1}AP$  is a diagonal matrix.

[Question ID = 9492]

1. 
$$P = \begin{bmatrix} -1 & 1 & 1 \\ 0 & -\sqrt{2} & \sqrt{2} \\ 1 & 1 & 1 \end{bmatrix}$$

[Option ID = 37962]

2. 
$$P = \begin{bmatrix} 1 & 1 & 1 \\ 0 & -\sqrt{2} & \sqrt{2} \\ 1 & 1 & 1 \end{bmatrix}$$

[Option ID = 37963]

3. 
$$P = \begin{bmatrix} -1 & -1 & 1 \\ 0 & -\sqrt{2} & \sqrt{2} \\ 1 & 1 & 1 \end{bmatrix}$$

[Option ID = 37964]

4. 
$$P = \begin{bmatrix} -1 & 1 & 1 \\ 0 & -\sqrt{2} & \sqrt{2} \\ 1 & -1 & 1 \end{bmatrix}$$

[Option ID = 37965]

Correct Answer :-

- $$P = \begin{bmatrix} -1 & 1 & 1 \\ 0 & -\sqrt{2} & \sqrt{2} \\ 1 & 1 & 1 \end{bmatrix}$$

[Option ID = 37962]

28) Find the constants  $a, b$  and  $c$  so that

$$\vec{F} = (x + 2y + az)\hat{i} + (bx - 3y - z)\hat{j} + (4x + cy + 2z)\hat{k}$$

is irrotational.

[Question ID = 9493]

1.  $a = -1, b = 2, c = 4$

[Option ID = 37966]

2.  $a = 4, b = 2, c = -1$

[Option ID = 37967]

3.  $a = -1, b = 4, c = 4$

[Option ID = 37968]

4.  $a = 4, b = -2, c = 4$

[Option ID = 37969]

Correct Answer :-

•  $a = 4, b = 2, c = -1$

[Option ID = 37967]

29) A vector field is given by  $\vec{F} = (\sin y)\hat{i} + x(1 + \cos y)\hat{j}$ . Evaluate the line integral over a circular path  $x^2 + y^2 = a^2, z = 0$ .

[Question ID = 9494]

1.  $\pi a$

[Option ID = 37970]

2.  $3\pi a^2$

[Option ID = 37971]

3.  $4\pi a^2$

[Option ID = 37972]

4.  $\pi a^2$

[Option ID = 37973]

Correct Answer :-

•  $\pi a^2$

[Option ID = 37973]

30) Suppose that a book of 600 pages contains 40 printing mistakes. Assume that these errors are randomly distributed throughout the book and  $x$ , the number of errors per page has a Poisson distribution. What is the probability that 10 pages selected at random will be free of errors?

[Question ID = 9495]

1. 0.11

[Option ID = 37974]

2. 0.21

[Option ID = 37975]

3. 0.51

[Option ID = 37976]

4. 0.41

[Option ID = 37977]

Correct Answer :-

• 0.51

[Option ID = 37976]

31) Evaluate the integral

$$\int_0^{2\pi} \frac{d\theta}{5 - 3 \cos \theta}$$

[Question ID = 9496]

1. zero [Option ID = 37978]

2.  $\pi/2$

[Option ID = 37979]

3.  $\pi i$

[Option ID = 37980]

4.  $2\pi i$

[Option ID = 37981]

Correct Answer :-

•  $\pi/2$

[Option ID = 37979]

32) Evaluate

$$\int_0^{\infty} t e^{-3t} \sin t \, dt$$

[Question ID = 9497]

1.  $3/50$

[Option ID = 37982]

2.  $1/50$

[Option ID = 37983]

3.  $3\pi/50$

[Option ID = 37984]

4.  $\pi/50$

[Option ID = 37985]

Correct Answer :-

•  $3/50$

[Option ID = 37982]

33) Solve for  $f(x)$  from the integral equation  $\int_0^{\infty} f(x) \cos sx \, dx = e^{-s}$

where the Fourier sine and cosine transform of a function  $f(x)$  may be defined as

$$F(s) = \sqrt{\frac{2}{\pi}} \int_0^{\infty} f(x) \sin sx \, dx \quad \text{and} \quad F(s) = \sqrt{\frac{2}{\pi}} \int_0^{\infty} f(x) \cos sx \, dx$$

respectively.

[Question ID = 9498]

1.  $\frac{2}{\pi} \frac{1}{1+x^2}$

[Option ID = 37986]

2.  $\frac{2}{3\pi} \frac{1}{1+x^2}$

[Option ID = 37987]

3.  $\frac{1}{\pi} \frac{1}{1-x^2}$

[Option ID = 37988]

4.  $\frac{2}{3\pi} \frac{1}{1-x^2}$

[Option ID = 37989]

Correct Answer :-

•  $\frac{2}{\pi} \frac{1}{1+x^2}$

[Option ID = 37986]

34) According to Einstein relation, for any semiconductor the ratio of diffusion constant to mobility of carriers

[Question ID = 9499]

1. depends upon the temperature of the semiconductor. [Option ID = 37990]

2. depends upon the type of semiconductor [Option ID = 37991]

3. varies with life time of the semi conductor [Option ID = 37992]

4. is a universal constant [Option ID = 37993]

Correct Answer :-

• depends upon the temperature of the semiconductor. [Option ID = 37990]

35) A common emitter transistor amplifier has an a.c. current gain of 20 and input resistance of  $1k\Omega$ . If the load (output) resistance is  $5k\Omega$ , find the change in output voltage if the input voltage changes by  $1V$ .

[Question ID = 9500]

1.  $10V$

[Option ID = 37994]

2.  $100V$

[Option ID = 37995]

3.  $1V$

[Option ID = 37996]

4.  $50VV$

[Option ID = 37997]

Correct Answer :-

•  $100V$

[Option ID = 37995]

36)  $11001, 1001$  and  $111001$  correspond to the 2's complement representation of which one of the following sets of number?

[Question ID = 9501]

1. 25, 9 and 57 respectively [Option ID = 37998]

2. -6, -6 and -6 respectively [Option ID = 37999]

3. -7, -7 and -7 respectively [Option ID = 38000]

4. -25, -9, and -57 respectively [Option ID = 38001]

Correct Answer :-

• -7, -7 and -7 respectively [Option ID = 38000]

37) If the function  $W, X, Y$  and  $Z$  are as follows

$$W = R + \bar{P}A + \bar{R}S$$

$$X = PQ\bar{R}\bar{S} + \bar{P}\bar{Q}\bar{R}\bar{S} + P\bar{Q}\bar{R}\bar{S}$$

$$Y = RS + \overline{PR + P\bar{Q} + \bar{P}\bar{Q}}$$

$$Z = R + S + \overline{PQ + \bar{P}\bar{Q}\bar{R} + P\bar{Q}\bar{S}}$$

[Question ID = 9502]

1.  $W = Z, X = \bar{Z}$

[Option ID = 38002]

2.  $W = Z, X = Y$

[Option ID = 38003]

3.  $W = Y$

[Option ID = 38004]

4.  $W = Y = \bar{Z}$

[Option ID = 38005]

Correct Answer :-

•  $W = Z, X = \bar{Z}$

[Option ID = 38002]

38) A 4-bit modulo-16 ripple counter uses JK flip-flops. If the propagation delay of each FF is 50ns, the maximum clock frequency that can be used is equal to

[Question ID = 9503]

1. 20MHz [Option ID = 38006]

2. 10MHz [Option ID = 38007]

3. 5MHz [Option ID = 38008]

4. 4MHz [Option ID = 38009]

Correct Answer :-

• 5MHz [Option ID = 38008]

39) A 3-bit D/A converter with resistance values  $R = 3k\Omega$  and reference voltage of  $12V$  is to be used with an op-amp of infinite gain and feedback resistance  $8k\Omega$ . The output voltage corresponding to the binary input 101 is

[Question ID = 9504]

1.  $-10V$

[Option ID = 38010]

2.  $-40V$

[Option ID = 38011]

3.  $-20V$

[Option ID = 38012]

4.  $-80V$

[Option ID = 38013]

Correct Answer :-

•  $-40V$

[Option ID = 38011]

40) For the circuit shown in Fig.1, the initial conditions are zero. Its transfer function  $H(s) = \frac{V_c(s)}{V_i(s)}$  is

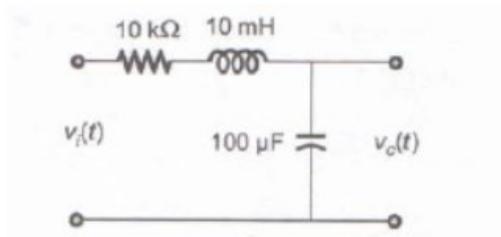


Fig.1

[Question ID = 9505]

1.  $\frac{1}{s^2 + 10^6 s + 10^6}$

[Option ID = 38014]

2.  $\frac{10^6}{s^2 + 10^8 s + 10^6}$

[Option ID = 38015]

3.  $\frac{10^8}{s^2 + 10^8 s + 10^6}$

[Option ID = 38016]

4.  $\frac{10^6}{s^2 + 10^6 s + 10^6}$

[Option ID = 38017]

Correct Answer :-

•  $\frac{10^6}{s^2 + 10^6 s + 10^6}$

[Option ID = 38017]

41) The minimal function that can detect a “ divisible by 3” 8421 BCD code digit (representation is  $D_8 D_4 D_2 D_1$ ) is given by

[Question ID = 9506]

1.  $D_8 D_1 + D_4 D_2 + \bar{D}_8 D_2 D_1$

[Option ID = 38018]

2.  $D_8 D_1 + D_4 D_2 \bar{D}_1 + \bar{D}_4 D_2 D_1 + \bar{D}_8 \bar{D}_4 \bar{D}_2 \bar{D}_1$

[Option ID = 38019]

3.  $D_8 D_1 + D_4 D_2 + \bar{D}_8 \bar{D}_4 \bar{D}_2 \bar{D}_1$

[Option ID = 38020]

4.  $D_4 D_2 \bar{D}_1 + D_4 D_2 D_1 + D_8 \bar{D}_4 D_2 D_1$

[Option ID = 38021]

Correct Answer :-

•  $D_8 D_1 + D_4 D_2 \bar{D}_1 + \bar{D}_4 D_2 D_1 + \bar{D}_8 \bar{D}_4 \bar{D}_2 \bar{D}_1$

[Option ID = 38019]

42) A 4-bit shift register circuit configured for right-shift operation, i.e.,  $D_{in} \rightarrow A, A \rightarrow B, B \rightarrow C, C \rightarrow D$ , is shown in Fig.2. If the present state of the shift register is  $ABCD = 1101$ , the number of clock cycles required to reach the state  $ABCD = 1111$  is

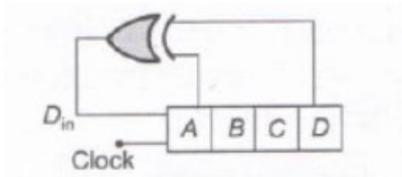


Fig.2

[Question ID = 9507]

1. 5  
[Option ID = 38022]
2. 10  
[Option ID = 38023]
3. 15  
[Option ID = 38024]
4. 20  
[Option ID = 38025]

Correct Answer :-

- 10  
[Option ID = 38023]

43) The state diagram of a finite state machine (FSM) designed to detect an overlapping sequence of three bits is shown in Fig.3. The FSM has an input 'in' and an output 'Out'. The initial state of the FSM is  $S_0$ .

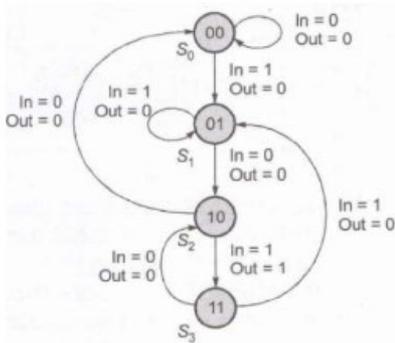


Fig.3

If the input sequence is 10101101001101, starting with the leftmost bit, then the number of times 'Out' will be 1 is

[Question ID = 9508]

1. 4  
[Option ID = 38026]
2. 3  
[Option ID = 38027]
3. 2  
[Option ID = 38028]
4. 1  
[Option ID = 38029]

Correct Answer :-

- 4  
[Option ID = 38026]

44) Choose the correct statement from the following:

- (a) PROM contains a programmable AND array and a fixed OR array
- (b) PLA contains a fixed AND array and a programmable OR array
- (c) PROM contains a fixed AND array and a programmable OR array
- (d) PLA contains a programmable AND array and a programmable OR array

[Question ID = 9509]

1. a, b [Option ID = 38030]
2. b, c [Option ID = 38031]
3. c, d [Option ID = 38032]
4. a, d [Option ID = 38033]

Correct Answer :-

- c, d [Option ID = 38032]

45) In an 8085 microprocessor , the shift registers which store the result of an addition and the overflow bit are, respectively

[Question ID = 9510]

1. B and F [Option ID = 38034]
2. A and F [Option ID = 38035]
3. H and F [Option ID = 38036]
4. A and C [Option ID = 38037]

Correct Answer :-

- A and F [Option ID = 38035]

46) For the 8085 assembly language program given below(Fig.4), the content of the accumulator after the execution of the program is

```

3000H MVI A, 45H
3002H MOV B, A
3003H STC
3004H CMC
3005H RAR
3006H XRA B

```

Fig.4

[Question ID = 9511]

1. 00H [Option ID = 38038]
2. 45H [Option ID = 38039]
3. 67H [Option ID = 38040]
4. E7H [Option ID = 38041]

Correct Answer :-

- 67H [Option ID = 38040]

47) Evaluate

$$\iint_S \sqrt{xy - y^2} dx dy$$

, where S is a triangle with vertices (0,0), (10,1) and (1,1).

[Question ID = 11229]

1. 1/6 [Option ID = 44910]
2. 1/3

[Option ID = 44911]

3. 3 [Option ID = 44912]
4. 6 [Option ID = 44913]

Correct Answer :-

- 6 [Option ID = 44913]

Topic:- INFO MSC S2\_P2

1) Read the following information to answer the given questions

Six friends A, B, C, D, E and F are sitting in a row facing towards North .

C is sitting between A and E, D is not at the end.

B is sitting immediate right to E. F is not at the right end.

How many persons are there to the right of D?

**[Question ID = 9513]**

1. One

[Option ID = 38046]

2. Two

[Option ID = 38047]

3. Three

[Option ID = 38048]

4. Four

[Option ID = 38049]

**Correct Answer :-**

- Four

[Option ID = 38049]

**2) Read the following information to answer the given questions**

Six friends A, B, C, D, E and F are sitting in a row facing towards North .

C is sitting between A and E, D is not at the end.

B is sitting immediate right to E.

F is not at the right end.

Who is immediate left of C?

**[Question ID = 9514]**

1. A

[Option ID = 38050]

2. E

[Option ID = 38051]

3. Either E or A

[Option ID = 38052]

4. B

[Option ID = 38053]

**Correct Answer :-**

- A

[Option ID = 38050]

**3) Read the following information to answer the given questions**

Six friends A, B, C, D, E and F are sitting in a row facing towards North .

C is sitting between A and E, D is not at the end.

B is sitting immediate right to E.

F is not at the right end.

Who is at the right end?

**[Question ID = 9515]**

1. A

[Option ID = 38054]

2. B

[Option ID = 38055]

3. E

[Option ID = 38056]

4. D

[Option ID = 38057]

**Correct Answer :-**

- B

[Option ID = 38055]