

PREVIEW QUESTION BANK

Module Name : SCPH17 Micro Systems - ENG
Exam Date : 27-Oct-2023 Batch : 09:30-12:30

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negativ Marks
Objective Question				
1	983001	Delibrate Sampling is also known as 1. Probability sampling 2. Non-probability sampling 3. Systematic sampling 4. Area sampling A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
Objective Question				
2	983002	What is the proper sequence of defining a research problem? 1. a. developing the ideas through discussions b. surveying the available literature c. general statement of the problem d. understanding the nature of the problem. e. Phrasing the research problem into a working proposition 2. a. general statement of the problem b. developing the ideas through discussions c. surveying the available literature d. understanding the nature of the problem. e. Phrasing the research problem into a working proposition 3. a. general statement of the problem b. understanding the nature of the problem. c. surveying the available literature d. developing the ideas through discussions e. Phrasing the research problem into a working proposition 4. a. surveying the available literature b. developing the ideas through discussions c. understanding the nature of the problem. d. general statement of the problem e. Phrasing the research problem into a working proposition A1 : 1	4.0	0.0

A2 : 2

A3 : 3

A4 : 4

Objective Question

3	983003	Which of the following is NOT a type of <i>formal experimental design</i>? 1. Randomized block design 2. Latin Square design 3. Factorial design 4. Control design A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

4	983004	Which of the following experimental design is very frequently used in agricultural research? 1. Randomized block design 2. Latin Square Design 3. Factorial Design 4. Before-and-after with control design A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

5	983005	Which of the following statement is incorrect? 1. Sampling errors are absent in census survey 2. Non-sampling errors are present in both sample survey and census survey 3. Sample survey is more accurate than the census survey 4. Census survey is better than the sample survey, only if the population so large. A1 : 1 A2 : 2 A3 : 3	4.0	0.0
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A4 : 4

Objective Question

6	983006	If a population from which a sample is to be drawn does not constitute a homogeneous group, _____ technique is generally applied in order to obtain a representative sample. 1. Simple Random Sampling 2. Systematic Sampling 3. Stratified Sampling 4. Cluster Sampling A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

7	983007	_____ scales of measurement have an absolute or true zero of measurement. 1. Nominal Scale 2. Ordinal Scale 3. Ratio Scale 4. Interval Scale A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

8	983008	Which one of the following is not a primary data collection technique? 1. Warranty card method 2. Questionnaire method 3. Data through Schedule method 4. Data from Publications A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

9	983009		4.0	0.0
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In the following listed pictorial techniques of primary data collection, which test contains 45 inkblot cards based on colour, movement, shading and other factors?

1. Holtzman test
2. Rorschach test
3. Rosenzweig test
4. Thematic apperception test

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

10	983010	Mention the type of the data analysis corresponding to the following statement. The analysis adapted when the researcher has one dependent variable which is presumed to be a function of two or more independent variables is _____ . 1. Canonical analysis 2. Multivariate analysis of variance 3. Multiple regression analysis 4. Multiple discriminant analysis A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

11	983011	The determinant of matrix A is 6 and the determinant of matrix B is 50. The determinant of matrix AB is 1. 300 2. 600 3. 6 4. 50 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

12	983012		4.0	0.0
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A vector field is given as $x\hat{a}_x + y\hat{a}_y + z\hat{a}_z$, the divergence of this vector field

is

1. $\frac{1}{3}$
2. 0
3. 1
4. 3

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

13	983013	The distinct values of y that satisfy $\sin(y) = \frac{y}{2}$, with y in radians, are 1. More than or equal to 4 2. 3 3. 2 4. 1 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

14	983014	The value of the integral $\int_0^1 \frac{dx}{\sqrt{1-x}}$ is 1. 2 2. 4 3. 0 4. -4 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

15	983015		4.0	0.0
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The order of the given differential equation is

$$\frac{d^2 y}{dt^2} + \left(\frac{dy}{dt}\right)^3 + y^4 = \exp(-2t)$$

1. 1
2. 3
3. 4
4. 2

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

16 983016 The solution of the differential equation $\frac{dy}{dx} = ky$ with $y(0) = a$, is

1. $x = a \exp(-ky)$
2. $x = k \exp(ay)$
3. $y = a \exp(kx)$
4. $y = a \exp(-kx)$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

17 983017 The probability of obtaining at least two "six" in rolling a fair die four times is

1. 13.2%
2. 12.3%
3. 16.2%
4. 1.32%

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

18 983018

The probability of producing a defective bolt is 0.01, what is the probability that a lot of 100 bolts will contain not more than 2 defective bolts.

1. 91.97%
2. 82.87%
3. 90%
4. 95%

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

19	983019	The variance of the sum of random variables equals the sum of variances of these variables. This statement is valid for 1. All types of random variables 2. Independent random variables 3. Dependent random variables 4. This statement is never valid. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

20983020

Match **Group-I** with **Group-II**

Group-I	Group-II
Method	Applications
(A). Netwon-Raphson	(I). Solving nonlinear equations
(B). Runge-Kutta	(II). Solving linear simultaneous equations
(C). Simpsons rule	(III). Solving ordinary differential equations
(D). Gauss elimination	(IV). Numerical Integration

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

2. (A) - (I), (B) - (III), (C) - (IV), (D) - (II)

3. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

4.00.0

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

21 983021

4.0 0.0

The Spearman's coefficient of correlation is given as _____

where,

d_i = difference between ranks of i th pair of the two variables

n = Number of pairs of observations

1. $1 - \left[\frac{6 \sum d_i^2}{n(n^2-1)} \right]$
2. $1 - \left[\frac{6 \sum d_i^2}{n(1-n^2)} \right]$
3. $1 - \left[\frac{6 \sum d_i^2}{n^2(n-1)} \right]$
4. $1 - \left[\frac{6 \sum d_i^2}{n^2(1-n)} \right]$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

22 983022

4.0 0.0

Match List-I with List-II

List-I	List-II
(A) Secular Trend	(I) Long term fluctuations with recurring rises and declines
(B) Irregular fluctuations	(II) Short duration fluctuations that occur at regular sequence at specific intervals of time
(C) Cyclic fluctuations	(III) Shows the direction of the series in a long period of time
(D) Seasonal fluctuations	(IV) Variations that are unpredictable fashion

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
2. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
3. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

23 983023

4.0 0.0

What is property of Sufficiency?

1. An estimator with a relatively small variance
2. An estimator that approaches the value of population parameter as the sample size becomes larger and larger
3. An estimator that uses as much as possible the information available from the sample.
4. An estimator with average of all sample mean same is population mean.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

24 983024

4.0 0.0

Determine the population variance for the population of size four: 18, 20, 22 and 24.

1. 8
2. 5
3. 2
4. 21

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

25 983025

4.0 0.0

Which one of the following related to "Hypothesis" is NOT true?

1. Hypothesis should be limited in Scope
2. Hypothesis should be broad
3. Hypothesis should be capable of being tested
4. Hypothesis should be consistent.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

26	983026	We cannot reject the null hypothesis, when _____ 1. the value of test statistic < lower critical value or the value of test statistic > upper critical value for a two-tailed test 2. the value of test statistic > critical value for a right tailed test 3. the value of test statistic < critical value for a left-tailed test 4. the value of test statistic > lower critical value or the value of test statistic < upper critical value for a two-tailed test A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

27	983027	_____ means rejection of hypothesis which should have been accepted and _____ means accepting the hypothesis which should have been rejected. 1. Type I errors, Type II errors 2. Type II errors, Type I errors 3. Null hypothesis, Alternate hypothesis 4. Alternate hypothesis, Null hypothesis A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

28	983028	Which of the sampling distributions are used for large sized samples? 1. Normal distribution 2. t - distribution 3. F - distribution 4. Chi - Square distribution A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

29	983029		4.0	0.0
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Which of the following is a parametric test of significance for chi-square distribution?

1. Test of mean
2. Test of goodness of fit
3. Test of independence of attributes
4. Test of difference of more than two proportions

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

30 983030

4.0 0.0

Which of the following is NOT a reason concerning the improper application or misuse of chi-square test?

1. Neglect of frequencies of non-occurrence
2. Failure to equalise the sum of observed and the sum of the expected frequencies
3. Inconsistency of the coefficient of contingency
4. Wrong computations

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

31 983031

4.0 0.0

Given that $M^4 = I, M \neq I, M^2 \neq I, M^3 \neq I$, where I is an identity matrix. Then for any natural number k , M^{-1} is

1. M^{4k+1}
2. M^{4k+2}
3. M^{4k+3}
4. M^{4k}

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

32 983032

4.0 0.0

Rank of $p \times q$ matrix, where $p < q$, cannot be more than

1. p
2. q
3. pq
4. p^2

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

33 983033 4.0 0.0

$\lim_{\theta \rightarrow 0} \frac{\sin(\frac{\theta}{2})}{\theta}$ is

1. 0
2. 1
3. 0.5
4. 2

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

34 983034 4.0 0.0

A fair dice is rolled twice. The probability that an odd number will follow an even number is

1. $\frac{1}{2}$
2. $\frac{1}{3}$
3. $\frac{1}{6}$
4. $\frac{1}{4}$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

35 983035 4.0 0.0

If $x = 2$ is the initial approximation of the solution, then the next approximation, using the Newton Raphson method, for the equation $x^3 - x^2 + 4x - 4 = 0$ will be

1. $\frac{2}{3}$
2. $\frac{4}{3}$
3. 1
4. $\frac{3}{2}$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

36	983036	The system of linear equations $4x + 2y = 7$ $2x + y = 6$ has 1. a unique solution 2. no solution 3. infinite number of solutions 4. exactly two identical solutions A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

37	983037	Find the residue of $X(z)$ at its poles $X(z) = \frac{1-2z}{z(z-1)(z-2)}$ 1. $\frac{1}{2}, 1, \frac{-3}{2}$ 2. $\frac{1}{2}, -1, \frac{3}{2}$ 3. $\frac{1}{2}, 1, \frac{3}{2}$ 4. $\frac{-1}{2}, -1, \frac{-3}{2}$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

38	983038	Contour in z-plane given by $z - \frac{i}{2} = 1$, the value of the integral $\oint \frac{dz}{1+z^2}$ is 1. $\tan^{-1}(z)$ 2. π 3. $\tan^{-1}(\pi z)$ 4. 0 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

39	983039	Given that matrix $A = \begin{pmatrix} -5 & -3 \\ 2 & 0 \end{pmatrix}$, and I is an identity matrix of size 2×2. The value of A^3 is 1. $30A + 19I$ 2. $19A + 30I$ 3. $A + 30I$ 4. $19A + I$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

40	983040	Find the maximum value of function $f(x) = x^2 - x - 2$, in $[-4, 4]$. 1. 8 2. 10 3. 18 4. 28 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

41	983041		4.0	0.0
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A measure of relationship or dependency between two attributes is given by

1. magnitude of association
2. coefficient of contingency
3. goodness of fit
4. degree of freedom

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

42	983042	Following is NOT an assumption in ANOCOVA technique: 1. Treatment groups are selected in blocks from the population 2. The groups are homogeneous in variability 3. The relationship is linear from group to group 4. Treatment groups are selected in random from the population	4.0	0.0
		A1 : 1		
		A2 : 2		
		A3 : 3		
		A4 : 4		

Objective Question

43	983043	The method that is NOT a type of variable elimination technique in linear regression analysis is 1. stepwise method 2. F-test (ANOVA) 3. forward inclusion method 4. backward elimination method	4.0	0.0
		A1 : 1		
		A2 : 2		
		A3 : 3		
		A4 : 4		

Objective Question

44	983044		4.0	0.0
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Preliminary data collection is a part of the

1. Descriptive research
2. Explorative research
3. Applied research
4. Explanatory research

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

45	983045	Conducting surveys is the most common method of generating 1. Primary data 2. Secondary data 3. Qualitative data 4. Experiment data A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

46	983046	Which of the following is NOT a limitation of case study? 1. Real information is NOT collected. 2. Case situations are easily comparable. 3. Case study is based on several assumptions 4. Response of the investigator A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

47	983047		4.0	0.0
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Mean, Median and Mode are

1. Measures of central tendency
2. Measures of dispersion
3. Measures of skewness
4. Measures of relationship

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

48	983048	Which of the property below is NOT a Covariance property? 1. $Cov(X + a, Y + b) = Cov(X, Y)$ 2. $Cov(aX, bY) = ab Cov(X, Y)$ 3. $Cov(\frac{X}{a}, \frac{Y}{b}) = \frac{1}{ab} Cov(X, Y)$ 4. $-\infty \leq Cov(X, Y) \leq \infty$	4.0	0.0
		A1 : 1 A2 : 2 A3 : 3 A4 : 4		

Objective Question

49	983049	Which of the following statement related to sampling error is incorrect? 1. Sampling errors occur randomly 2. Sampling error are likely to be in both the directions 3. Sampling error is directly proportional to the size of the sample. 4. The sampling error depends on the nature of the homgenity of the universe	4.0	0.0
		A1 : 1 A2 : 2 A3 : 3 A4 : 4		

Objective Question

50	983050		4.0	0.0
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Which of the following is NOT a scale construction technique?

1. Response form approach
2. Arbitrary approach
3. Consensus approach
4. Item analysis approach

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

51 983051

For an NMOS current source, the total thermal noise in the drain current for a band from 1 kHz to 1 MHz is given as

1. $2.67 \text{ kTg}_m 10^6 \text{ A}^2$
2. $2.67 \text{ kTg}_m 10^5 \text{ A}^2$
3. $2.67 \text{ kTg}_m 10^4 \text{ A}^2$
4. $2.67 \text{ kTg}_m \text{ A}^2$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

4.0 0.0

Objective Question

52 983052

The present state output Q_n of an edge triggered JK flip-flop is logic 0. If $J = 1$, then Q_{n+1}

1. can not be determined
2. will be logic 1
3. will be logic 0
4. will race around

A1 : 1

A2 : 2

A3 : 3

A4 : 4

4.0 0.0

Objective Question

53 983053

4.0 0.0

Match **List-I** with **List-II**

List-I	List-II
(A) PIN diode	(I) tuned circuit
(B) Zener diode	(II) current controlled attenuator
(C) LASER diode	(III) voltage reference
(D) Varactor diode	(IV) population inversion

Choose the **correct** answer from the options given below:

- (A) - (IV), (B) - (III), (C) - (I), (D) - (II)
- (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
- (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
- (A) - (II), (B) - (I), (C) - (IV), (D) - (III)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

54 983054

4.0 0.0

In a forward biased pn junction, the sequence of events that best describes the mechanism of current flow is

- injection, subsequent diffusion and recombination of minority carriers
- injection, subsequent drift and generation of minority carriers
- extraction, subsequent diffusion and generation of minority carriers
- extraction, subsequent drift and recombination of minority carriers

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

55 983055

4.0 0.0

The drain and gate of an n-channel MOSFET is shorted. Given that $V_{GS} = V_{DS}$ and the threshold voltage (V_T) of MOSFET is 1 V. If the drain current (I_D) is 1 mA for $V_{GS} = 2$ V, then for $V_{GS} = 4$ V, I_D is

- 2 mA
- 3 mA
- 9 mA
- 4 mA

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

56 983056

4.0 0.0

How many number of NAND gates are required to implement an XOR gate?

1. Three
2. Five
3. Four
4. Six

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

57 983057

4.0 0.0

A synchronous counter is realized using two D-flip flops. It goes through $Q_B Q_A$ sequence $00 \rightarrow 11 \rightarrow 01 \rightarrow 10 \rightarrow 00$. The connections to the inputs D_A & D_B are

1. $D_A = Q_B, D_B = Q_A$
2. $D_A = \bar{Q}_A, D_B = \bar{Q}_B$
3. $D_A = (Q_A \bar{Q}_B + \bar{Q}_A Q_B), D_B = Q_A$
4. $D_A = (Q_A Q_B + \bar{Q}_A \bar{Q}_B), D_B = \bar{Q}_B$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

58 983058

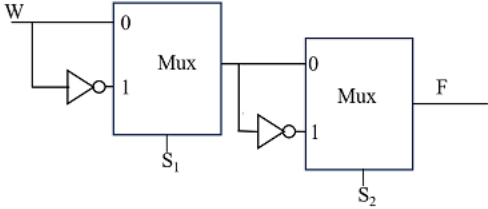
4.0 0.0

Convert Gray code 1101 to binary

1. 1010
2. 1001
3. 1101
4. 1011

A1 : 1

A2 : 2

10/30/23, 10:20 AM		248_SCPH17_Live_E_1-100.html	
		A3 : 3	
		A4 : 4	
Objective Question			
59	983059	Convert the following $(39.10)_{10} = (\quad)_8$ 1. $(74.4)_8$ 2. $(93.5)_8$ 3. $(39.5)_8$ 4. $(47.4)_8$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0 0.0
Objective Question			
60	983060	 Which one of the following boolean function is realized by the circuit? 1. $F = W\bar{S}_1\bar{S}_2$ 2. $F = WS_1 + WS_2 + S_1S_2$ 3. $F = \bar{W} + S_1 + S_2$ 4. $F = W \oplus S_1 \oplus S_2$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0 0.0
Objective Question			
61	983061	At absolute zero temperature, what will be the intrinsic carrier concentration (n_i) in Silicon semiconductor? 1. $1.5 \times 10^{10} / cm^3$ 2. 0 3. $0 < n_i < 1.5 \times 10^{10} / cm^3$ 4. Greater than $(>) 1.5 \times 10^{10} / cm^3$	4.0 0.0

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

62 983062

4.0 0.0

In a semiconductor, there are two scattering processes present. The electron mobilities due to the first and second scattering processes are $\mu_1 = 700 \text{ cm}^2/(\text{V-s})$ and $\mu_2 = 300 \text{ cm}^2/(\text{V-s})$ respectively. The total electron mobility μ is

1. $700 \text{ cm}^2/(\text{V-s})$
2. $300 \text{ cm}^2/(\text{V-s})$
3. $210 \text{ cm}^2/(\text{V-s})$
4. $1000 \text{ cm}^2/(\text{V-s})$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

63 983063

4.0 0.0

In an ideal step graded pn junction at equilibrium, where does the maximum electric field exist?

1. At the junction plane
2. At the edge of depletion region
3. In the neutral p or n region
4. At equilibrium, no electric field exists.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

64 983064

4.0 0.0

In a p^+-n junction, the n -type doping is increased by 4 times. How do the junction capacitance change if everything else remain unchanged?

1. It will increase by 4 times
2. It will decrease by 4 times
3. It will be doubled
4. It will be halved

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

65	983065	In a <i>pn</i> junction, at small forward bias voltage, deviation from ideal diode equation comes from 1. Recombination current 2. Ohmic losses 3. High-level injection 4. Breakdown A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

66	983066	In a GaAs MESFET, pinch-off voltage can be increased by 1. Increasing GaAs doping 2. Decreasing GaAs doping 3. Decreasing the channel width 4. It can not be changed since it is constant for GaAs. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

67	983067	Two dimensional electron gas (2DEG) is related to 1. Metal oxide semiconductor field effect transistor (MOSFET) 2. Metal semiconductor field effect transistor (MESFET) 3. High electron mobility transistor (HEMT) 4. Ideal gases A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

68	983068	At equilibrium, flat band voltage of a MOS capacitor 1. depends on work function difference of metal and semiconductor, and interface charge density 2. depends only on work function difference of metal and semiconductor 3. depends only on interface charge density 4. is zero A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

69	983069	A p-channel MOSFET is biased at following voltages: source voltage (V_S) = 0, gate voltage (V_G) = -2 V, and drain voltage (V_D) = -1 V. Threshold voltage (V_{tp}) of the MOSFET is -0.7 V. Which operating region the device is working in? 1. Saturation 2. Linear 3. Cut-off 4. Such biasing condition is not allowed for p-MOSFET device. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

70	983070	Si is not a preferred semiconductor material for a 1. MOSFET 2. Photodetector 3. Solar Cell 4. LASER A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

71	983071		4.0	0.0
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In the process of Czochralski method, which of the following relation is appropriate between melt and growing crystals?

1. Melt and growing crystals are not related to each other.
2. Melt and growing crystals are rotated counterclockwise.
3. Melt is rotating but growing crystal is not rotating
4. Nothing is rotating.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

72 983072 4.0 0.0

Consider a simple infinite RC ladder network consisting of only one branch. It consists identical resistances (R) and capacitances (C). What would be the Elmore delay from the first to last node (input to output) of the network?

1. RC
2. RC/2
3. RC/4
4. 2RC

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

73 983073 4.0 0.0

What is the minimum allowed supply voltage ($V_{DD,min}$) for a CMOS inverter?

1. $4kT/q$
2. Threshold voltage of nMOS (V_{tn})
3. Threshold voltage of pMOS (V_{tp})
4. $V_{tn} + V_{tp}$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

74 983074 4.0 0.0

What will be the effect of increasing the W/L ratio of nMOS in a CMOS inverter on switching threshold voltage (V_{th}) and V_{IL} ?

1. Both will decrease
2. Both will increase
3. V_{th} will decrease while V_{IL} will increase
4. V_{th} will increase while V_{IL} will decrease

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

75 983075

4.0 0.0

Following listed VLSI design styles take different prototyping time.

- (A) Gate array
- (B) Field programmable gate array
- (C) Standard-cell-design
- (D) Full-custom design

In order of increasing prototyping time, which of the following option is correct?

1. (A), (B), (C), (D)
2. (B), (A), (C), (D)
3. (B), (A), (D), (C)
4. (C), (B), (D), (A)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

76 983076

4.0 0.0

Find the correct sequence of steps involved in polysilicon gate MOSFET fabrication.

- (A). Entire wafer surface is coated & it is etched away with the help of mask to include source, drain and gate.
- (B). Contact area is defined by lithography.
- (C). Selective etching of SiO₂ and thin oxide growth.
- (D). Polysilicon deposition.
- (E). Thick oxide growth called field oxide.
- (F). Metalisation and interconnection between substrate and source.

- 1. (A), (B), (C), (D), (E), (F).
- 2. (A), (E), (C), (D), (B), (F).
- 3. (B), (A), (D), (C), (F), (E).
- 4. (C), (B), (D), (A), (E), (F).

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

77	983077	In a digital circuit, a control signal (ctr) path from node A to node B involves 500 ps of gate delay and 500 ps of wire delay. The chip is scalable and all dimensions are scaled by S, where $S = 2$. Voltage and gate oxide thickness remain unchanged. The gate delay of signal path is 1. 500 ps 2. 250 ps 3. 125 ps 4. 1000 ps A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

78	983078	In a digital circuit, a control signal (ctr) path from node A to node B involves 500 ps of gate delay and 500 ps of wire delay. The chip is scalable and all dimensions are scaled by S, where $S = 2$. Voltage and gate oxide thickness remain unchanged. The wire delay of signal path. 1. 500 ps 2. 250 ps 3. 125 ps 4. 1000 ps	4.0	0.0
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A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

79 983079

Find the maximum width of the wire to prevent electromigration in 180 nm technology with supply voltage of 1.8 V. Maximum power dissipation is 1 μ W. Length of the wire is 100 μ m; thickness of the wire is 250 nm; power density is 20 W/cm².

1. 10 μ m2. 15 μ m3. 20 μ m4. 30 μ m

A1 : 1

A2 : 2

A3 : 3

A4 : 4

4.0 0.0

Objective Question

80 983080

Silicon is doped with boron and phosphorous atoms with the concentration of 10^{17} /cm³ and 10^{13} /cm³, respectively. The hole concentration at room temperature is

1. 10^{17} /cm³2. 2.25×10^4 /cm³3. 2.25×10^3 /cm³4. 10^{13} /cm³

A1 : 1

A2 : 2

A3 : 3

A4 : 4

4.0 0.0

Objective Question

81 983081

For an N-type semiconductor, the hole concentration is

1. inversely proportional to the square of doping concentration

2. directly proportional to the intrinsic carrier concentration

3. inversely proportional to the doping concentration

4. inversely proportional to the intrinsic carrier concentration

A1 : 1

A2 : 2

4.0 0.0

A3 : 3

A4 : 4

Objective Question

82	983082	For an NMOS device, the inversion carrier density for $V_G = 1.8$ V is $2 \times 10^{11} \text{ cm}^{-2}$. For $V_G = 2.3$ V, the inversion carrier density is $4 \times 10^{11} \text{ cm}^{-2}$. The threshold voltage (V_T) is 1. 1.6 2. 0.65 3. 1.3 4. 1.8 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

83	983083	If the doping concentration of p-side is 4 times than the doping concentration of n-side. The ratio of depletion layer width of p-side versus n-side is 1. 0.25 2. 0.5 3. 0.75 4. 1 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

84	983084	In a semiconductor, the ratio of mobility to the diffusion coefficient has unit 1. V^{-1} 2. V 3. $\text{cm} \cdot \text{V}^{-1}$ 4. $\text{cm}^{-1} \cdot \text{V}$ A1 : 1 A2 : 2 A3 : 3	4.0	0.0
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A4 : 4

Objective Question

85 983085

4.0 0.0

For a half subtractor with B (subtrahend) - A (minuend) operation, the logical expressions for difference (D) and borrow (C) are

1. $D = \bar{A}B + AB$; $C = \bar{A}B$
2. $D = \bar{A}B + A\bar{B}$; $C = \bar{A}B$
3. $D = AB + \bar{A}\bar{B}$; $C = \bar{A}B$
4. $D = \bar{A}B + A\bar{B}$; $C = AB$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

86 983086

4.0 0.0

Match **List-I** with **List-II**

List-I	List-II
(A) Shift register	(I) One bit memory element
(B) Counter	(II) Addressing in memory chips
(C) Decoder	(III) Serial to parallel conversion
(D) RS-latch	(IV) Frequency division

Choose the **correct** answer from the options given below:

1. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
2. (A) - (III), (B) - (IV), (C) - (II), (D) - (I)
3. (A) - (I), (B) - (IV), (C) - (II), (D) - (III)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

87 983087

4.0 0.0

A D flip flop is used to realize a switch trail ring counter. The resulting circuit will act as

1. T flip flop
2. D flip flop
3. SR flip flop
4. JK flip flop

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

88 983088 4.0 0.0

Simplify the boolean expression

$$(X + Y')(X + Y) + ((X'Y') + X')'$$

1. X'
2. $X+Y'$
3. $X+Y$
4. X

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

89 983089 4.0 0.0

The configuration of cascode amplifier is

1. CS-CG
2. CS-CS
3. CD-CG
4. CD-CD

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

90 983090 4.0 0.0

Two identical MOSFETS are connected in parallel. Each characterized by the parameters g_m and r_0 . The composite MOSFET will then be characterized by parameters

1. $2g_m$ and $2r_0$
2. $0.5g_m$ and $2r_0$
3. $2g_m$ and $0.5r_0$
4. $0.5g_m$ and $0.5r_0$

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

91	983091	An npn BJT is biased such that $I_C = 10 \text{ mA}$ and $I_B = 0.1 \text{ mA}$. The current transfer ratio is 1. 0.99 2. 100 3. 0.95 4. 99 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

92	983092	Determine the probability that an energy level is occupied by an electron if the state is above fermi level by kT. 1. 0.2389 2. 0.0269 3. 0.2 4. 0.2689 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

93	983093		4.0	0.0
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A long-base Si step graded pn junction has been heavily doped on both sides. What is the probable breakdown mechanism?

1. Zener
2. Avalanche
3. Pinch-off
4. It will never go through breakdown.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

94	983094	A Si sample "A" is doped with 10^{17} /cm³ donor atoms. Another Si sample "B" is doped with 10^{17} /cm³ acceptor atoms. The ratio of electron to hole mobility is 4. What is the ratio of conductivity of sample B to A? 1. 4 2. 2 3. 0.5 4. 0.25 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

95	983095	A semiconductor is at equilibrium. In a given region, drift current is 10 mA. What will be the diffusion current? 1. 10 mA 2. -10 mA 3. 0 4. 20 mA A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	0.0
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Objective Question

96	983096		4.0	0.0
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What is the preferred mode of recombination in a moderately doped bulk Si Semiconductor?

1. Direct recombination
2. SRH recombination
3. Auger recombination
4. Surface recombination

A1 : 1

A2 : 2

A3 : 3

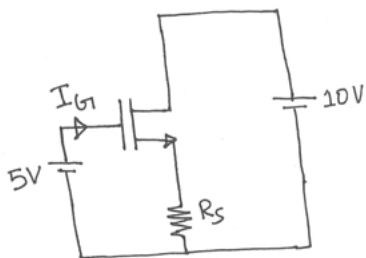
A4 : 4

Objective Question

97 983097

4.0 0.0

For the given Fig., what is the value of I_G ?



1. 0
2. 26 mA
3. 2 A
4. 52 mA

A1 : 1

A2 : 2

A3 : 3

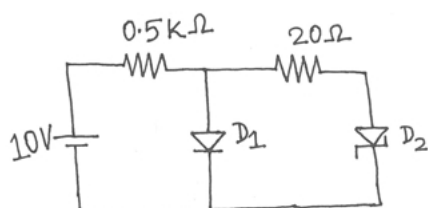
A4 : 4

Objective Question

98 983098

4.0 0.0

For the given Fig., assume forward bias voltage drop across PN diode D_1 and Schottky diode D_2 are 0.7 V and 0.3 V, respectively. Then in the circuit



1. Both diodes are ON
2. Both diodes are OFF
3. D_1 is ON, D_2 is OFF
4. D_1 is OFF, D_2 is ON

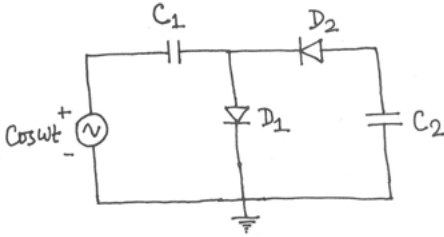
- A1 : 1
- A2 : 2
- A3 : 3
- A4 : 4

Objective Question

99 983099

4.0 0.0

The shown circuit is a



- 1. Voltage doubler
- 2. Voltage tripler
- 3. Amplifier
- 4. Voltage reference

- A1 : 1
- A2 : 2
- A3 : 3
- A4 : 4

Objective Question

100 983100

4.0 0.0

Which of these devices utilises a heterojunction?

- 1. BJT
- 2. HEMT
- 3. PN Diode
- 4. JFET

- A1 : 1
- A2 : 2
- A3 : 3
- A4 : 4