



P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
SEM END EXAMINATIONS DEC -2024
IB,SC MATHS STREAM : ADVANCES IN MATHEMATICAL,PHYSICAL & CHEMICAL
SCIENCES TIME: 2 HRS

SEMESTER	I	QP CODE	23CORE12(NEW)
DATE & SESSION	21.12.24 & AN	REG NO	
MAX MARKS			50

I. Answer the following Multiple-Choice Questions

21 X 1 = 21 M

- $\lim_{x \rightarrow 0} \frac{x^2 - 4}{x - 2}$ is
(A) 2 (B) -2 (C) 1 (D) -1
- If $y = \log(\tan x)$, then $\frac{dy}{dx}$ is
(A) $\frac{1}{\tan x}$ (B) $\frac{\sec^2 x}{\tan x}$ (C) $-\sec^2 x$ (D) 0
- $\frac{d}{dx}(x^2) =$
(A) $3x$ (B) $4x^2$ (C) $5x$ (D) $2x$
- $\int e^{\tan x} \sec^2 x dx =$
(A) $e^{\tan x}$ (B) $e^{\sin x}$ (C) $\tan x$ (D) $\sin x$
- If $A = \begin{bmatrix} 1 & 1 \\ 2 & 3 \end{bmatrix}$ then A^{-1} is
(A) $\begin{bmatrix} 3 & -1 \\ -2 & 2 \end{bmatrix}$ (B) $\begin{bmatrix} 3 & 1 \\ 2 & 2 \end{bmatrix}$ (C) $\begin{bmatrix} 3 & -1 \\ -2 & 2 \end{bmatrix}$ (D) $\begin{bmatrix} 2 & -1 \\ -2 & 3 \end{bmatrix}$
- How many types of biasing are there in the context of PV cells?
(A) 3 (B) 2 (C) 4 (D) 5
- How many types of hydroelectric power turbines are there?
(A) 5 (B) 4 (C) 3 (D) 2
- Satellite power requirement is provided through
(A) Solar cells (B) Dry cells (C) Nickel cadmium cells (D) Lead acid batteries
- The solar cells used in solar panel are used to convert solar energy into:
(A) Chemical energy (B) Mechanical energy (C) Electrical energy (D) None of these
- One of the principles of green chemistry says that to produce goods.
(A) Harmful (B) Commercial (C) Safer (D) Most used
- Green chemistry applies across the _____ of a chemical product like design, manufacture and use.
(A) Life cycle (B) Properties (C) Uses (D) Efficiency
- Which of the following is an example for nanowires of metals?
(A) Silicon (B) Nickel (C) DNA (D) None of the above
- Which of the following is not a green house gas?
(A) methane gas (B) water vapour (C) carbon dioxide (D) nitrogen gas
- Which of the following gas is produced from landfill wastes?
(A) Biogas (B) Natural gas (C) Liquefied petroleum gas (D) All of the above

1

- Activated carbon is used in water treatment for
(A) Disinfection (B) removing hardness (C) removing odour (D) aeration
- During treatment of water, sedimentation is done
(A) before filtration (B) after filtration (C) simultaneously with filtration (D) along with chlorination
- Biomechanics is a branch of
(A) Physics (B) Physical education (C) Kinesiology (D) Biology
- Conversion of binary to decimal involves multiplying each bit by power of ____
(A) Power of 10 (B) Power of 16 (C) Power of 8 (D) Power of 2
- The largest digit in the octal system is:
(A) 8 (B) 9 (C) 7 (D) A
- Which error detection technique is widely used in computer networks?
(A) CRC (B) Hamming code (C) Backward Error Correction (D) Forward Error Correction
- ____ is the intelligent device.
(A) Gateway (B) Router (C) Switch (D) All of the above

7 X 1 = 7 M

22. The value of determinant $\begin{vmatrix} 1 & 2 & 4 \\ -1 & 3 & 0 \\ 4 & 1 & 0 \end{vmatrix} =$ _____

23. $\frac{d}{dx}(\sin 4x) =$ _____

24. The _____ technique is a way of producing power from sunlight.

25. The solar cell converts from solar energy into _____ energy.

26. The bulk nanomaterials come under _____ dimensional nanomaterials

27. The process of removing colour from the surface of the fabric called _____

28. An even parity will have _____ of 1's in the transmitted data.

7 X 1 = 7 M

III. Answer the following. TRUE/FALSE

- 1:2 ratio the x - axis divide the line segment joining the points (2, -3) and (5,6) []
- Fullerene is an example of Zero-dimensional Nano materials. []
- Carbon dioxide is not Green house gas. []
- Elevated levels of nitrogen dioxide cannot cause damage to the human respiratory tract. []
- Glass packaging is an example of green packaging. []
- Sewage is a solid waste which causes water pollution and soil pollution. []
- A modulated signal travels longer distances when compared to original signal. []

IV. Answer the following Very Short / One Word Answer Questions.

7 X 1 = 7 M

- Find the equation of line parallel to x - axis drawn through the point of intersection of $2x + y - 3 = 0$ and $3x + 2y - 10 = 0$

2

37. Evaluate $\int x^2 \log x \, dx$
38. What is the full form of qubit?
39. Write any two applications of nano materials.
40. What is sludge?
41. Define a repeater.
42. List the types of signals.

V. Match the following.

2 X 4 =08 M

Column-I	Match Here	Column-II
43. Nitrogen gas	51 -	A. Natural dye
44. Alizarin	52 -	B. Fatigue
45. Carbon Monoxide	53 -	C. Not Green house gas
46. Mercury	54 -	D. Minamata

Column-I	Match Here	Column-II
47. Error detection	56 -	A. Modulation and Demodulation
48. Error Correction	57 -	B. Coding and decoding of signals
49. Modem	58 -	C. CRC
50. Codec	59 -	D. Hamming Code

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